TOSHIBA

FILE No. A10-1412

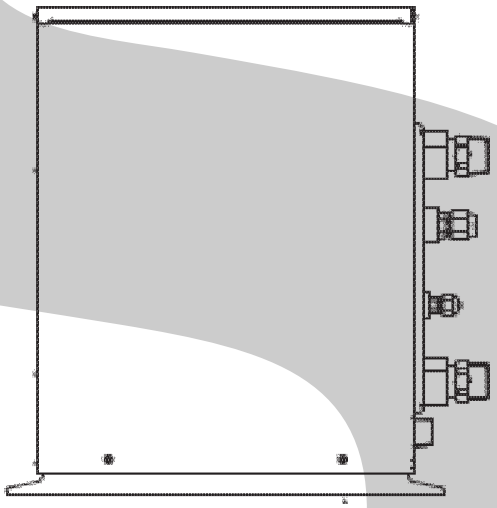
AIR CONDITIONER (MULTI TYPE)

SERVICE MANUAL

Hot Water Module

Model name:

MMW-AP0271LQ-E
MMW-AP0561LQ-E
MMW-AP0271LQ-TR
MMW-AP0561LQ-TR



PRINTED IN JAPAN, May., 2014, TOMO

CONTTENTS

1. SUMMARIES OF PRODUCT CHARACTERISTICS 11

2. SPECIFICATION 12

3. WIRING DIAGRAMS 13

4. PARTS RATING 14

5. REFRIGERANT CYCLE DIAGRAM 15

6. CONTROL OUTLINE 16

7. APPLIED CONTROL AND FUNCTIONS 19

- 7-1. Hot Water Module printed circuit board 19
- 7-2. Optional connector specifications of hot water module P.C. board 20
- 7-3. Test operation of hot water module unit 21
- 7-4. Method to set hot water module function DN code 22
- 7-5. Applied control of indoor unit (including Hot Water Module) 23
- 7-6. Test operation check 35

8. TROUBLESHOOTING 37

- 8-1. Overview 37
- 8-2. Troubleshooting method 38
- 8-3. Troubleshooting based on information displayed on remote controller 44
- 8-4. Check codes displayed on remote controller and SMMS outdoor unit (7-segment display on I/F board) and locations to be checked 45
- 8-5. Sensor characteristics 60

9. P.C. BOARD EXCHANGE PROCEDURES 62

10. DETACHMENTS 67

11. EXPLODED DIAGRAM / SERVICE PARTS LIST 75

12. OWNER'S MANUAL (EXCERPT) 78

13. INSTALLATION MANUAL (EXCERPT) 84

Please read carefully through these instructions that contain important information, and ensure that you understand them.

Generic Denomination: Hot Water Module

Definition of Qualified Installer or Qualified Service Person

The hot water module must be installed, maintained, repaired and removed by a qualified installer or qualified service person.
When any of these jobs is to be done, ask a qualified installer or qualified service person to do them for you.
A qualified installer or qualified service person is an agent who has the qualifications and knowledge described in the table

Agent	Qualifications and knowledge which the agent must have
Qualified installer	• The qualified installer is a person who installs, maintains, relocates and removes the air conditioners (including the hot water modules) made by Toshiba Carrier Corporation. He or she has been trained to install, maintain, relocate and remove the air conditioners (including the hot water modules) made by Toshiba Carrier Corporation or, alternatively, he or she has been instructed in such operations by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to these operations. • The qualified installer who is allowed to do the electrical work involved in installation, relocation and removal has the qualifications pertaining to this electrical work as stipulated by the local laws and regulations, and he or she is a person who has been trained in matters relating to electrical work on the air conditioners (including the hot water modules) made by Toshiba Carrier Corporation or, alternatively, he or she has been instructed in such matters by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to this work. • The qualified installer who is allowed to do the refrigerant handling and piping work involved in installation, relocation and removal has the qualifications pertaining to this refrigerant handling and piping work as stipulated by the local laws and regulations, and he or she is a person who has been trained in matters relating to refrigerant handling and piping work on the air conditioners (including the hot water modules) made by Toshiba Carrier Corporation or, alternatively, he or she has been instructed in such matters by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to this work. • The qualified installer who is allowed to work at heights has been trained in matters relating to working at heights with the air conditioners (including the hot water modules) made by Toshiba Carrier Corporation or, alternatively, he or she has been instructed in such matters by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to this work.
Qualified service person	• The qualified service person is a person who installs, repairs, maintains, relocates and removes the air conditioners (including the hot water modules) made by Toshiba Carrier Corporation. He or she has been trained to install, repair, maintain, relocate and remove the air conditioners (including the hot water modules) made by Toshiba Carrier Corporation or, alternatively, he or she has been instructed in such operations by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to these operations. • The qualified service person who is allowed to do the electrical work involved in installation, repair, relocation and removal has the qualifications pertaining to this electrical work as stipulated by the local laws and regulations, and he or she is a person who has been trained in matters relating to electrical work on the air conditioners (including the hot water modules) made by Toshiba Carrier Corporation or, alternatively, he or she has been instructed in such matters by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to this work. • The qualified service person who is allowed to do the refrigerant handling and piping work involved in installation, repair, relocation and removal has the qualifications pertaining to this refrigerant handling and piping work as stipulated by the local laws and regulations, and he or she is a person who has been trained in matters relating to refrigerant handling and piping work on the air conditioners (including the hot water modules) made by Toshiba Carrier Corporation or, alternatively, he or she has been instructed in such matters by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to this work. • The qualified service person who is allowed to work at heights has been trained in matters relating to working at heights with the air conditioners (including the hot water modules) made by Toshiba Carrier Corporation or, alternatively, he or she has been instructed in such matters by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to this work.

Definition of Protective Gear

When the air conditioner is to be transported, installed, maintained, repaired or removed, wear protective gloves and 'safety' work clothing.
In addition to such normal protective gear, wear the protective gear described below when undertaking the special work detailed in the table below.
Failure to wear the proper protective gear is dangerous because you will be more susceptible to injury, burns, electric shocks and other injuries.

Work undertaken	Protective gear worn
All types of work	Protective gloves 'Safety' working clothing
Electrical-related work	Gloves to provide protection for electricians and from heat Insulating shoes Clothing to provide protection from electric shock
Work done at heights (50 cm or more)	Helmets for use in industry
Transportation of heavy objects	Shoes with additional protective toe cap
Repair of outdoor unit	Gloves to provide protection for electricians and from heat

The important contents concerned to the safety are described on the product itself and on this Service Manual.
Please read this Service Manual after understanding the described items thoroughly in the following contents (Indications / Illustrated marks), and keep them.

[Explanation of indications]

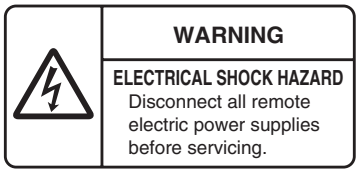
Indication	Explanation
⚠ **DANGER**	Indicates contents assumed that an imminent danger causing a death or serious injury of the repair engineers and the third parties when an incorrect work has been executed.
⚠ **WARNING**	Indicates possibilities assumed that a danger causing a death or serious injury of the repair engineers, the third parties, and the users due to troubles of the product after work when an incorrect work has been executed.
⚠ **CAUTION**	Indicates contents assumed that an injury or property damage (*) may be caused on the repair engineers, the third parties, and the users due to troubles of the product after work when an incorrect work has been executed.

***** Property damage: Enlarged damage concerned to property, furniture, and domestic animal / pet

[Explanation of illustrated marks]

Mark	Explanation
⃠	Indicates prohibited items (Forbidden items to do) The sentences near an illustrated mark describe the concrete prohibited contents.
●	Indicates mandatory items (Compulsory items to do) The sentences near an illustrated mark describe the concrete mandatory contents.
△	Indicates cautions (Including danger / warning) The sentences or illustration near or in an illustrated mark describe the concrete cautious contents.

Warning indications on the hot water module

Warning indication	Description
	**WARNING** **ELECTRICAL SHOCK HAZARD** Disconnect all remote electric power supplies before servicing.

Precautions for Safety

The manufacturer shall not assume any liability for the damage caused by not observing the description of this manual.

⚠ DANGER

Turn off breaker.	Before carrying out the installation, maintenance, repair or removal work, be sure to set the circuit breaker for both the hot water module and outdoor units to the OFF position. Otherwise, electric shocks may result.
	Before opening the electrical parts box cover of the hot water module or service panel of the outdoor unit, set the circuit breaker to the OFF position. Failure to set the circuit breaker to the OFF position may result in electric shocks through contact with the interior parts. Only a qualified installer (*1) or qualified service person (*1) is allowed to remove the electrical parts box cover of the hot water module or service panel of the outdoor unit and do the work required.
	When you have noticed that some kind of trouble (such as when an error display has appeared, there is a smell of burning, abnormal sounds are heard, the hot water module fails to heat or water is leaking) has occurred in the hot water module, do not touch the hot water module yourself but set the circuit breaker to the OFF position, and contact a qualified service person. Take steps to ensure that the power will not be turned on (by marking “out of service” near the circuit breaker, for instance) until qualified service person arrives. Continuing to use the hot water module in the trouble status may cause mechanical problems to escalate or result in electric shocks or other failure.
Electric shock hazard	When you access inside of the electrical parts box cover to repair electric parts, wait for about five minutes after turning off the breaker. Do not start repairing immediately.Otherwise you may get electric shock by touching terminals of high-voltage capacitors. Natural discharge of the capacitor takes about five minutes.
Prohibition	Place a “Work in progress” sign near the circuit breaker while the installation, maintenance, repair or removal work is being carried out. There is a danger of electric shocks if the circuit breaker is set to ON by mistake.
	Before operating the hot water module after having completed the work, check that the electrical parts box cover of the hot water module and service panel of the outdoor unit are closed, and set the circuit breaker to the ON position. You may receive an electric shock if the power is turned on without first conducting these checks.
Stay on protection	If, in the course of carrying out repairs, it becomes absolutely necessary to check out the electrical parts with the electrical parts box cover of one or more of the hot water modules and the service panel of the outdoor unit removed in order to find out exactly where the trouble lies, wear insulated heat-resistant gloves, insulated boots and insulated work overalls, and take care to avoid touching any live parts. You may receive an electric shock if you fail to heed this warning. Only qualified service person (*1) is allowed to do this kind of work.

⚠ WARNING

General	Before starting to repair the hot water module, read carefully through the Service Manual, and repair the hot water module by following its instructions.
	Only qualified service person (*1) is allowed to repair the hot water module. Repair of the hot water module by unqualified person may give rise to a fire, electric shocks, injury, water leaks and / or other problems.
	Do not use any refrigerant different from the one specified for complement or replacement. Otherwise, abnormally high pressure may be generated in the refrigeration cycle, which may result in a failure or explosion of the product or an injury to your body.
	Only a qualified installer (*1) or qualified service person (*1) is allowed to carry out the electrical work of the hot water module. Under no circumstances must this work be done by an unqualified individual since failure to carry out the work properly may result in electric shocks and / or electrical leaks.
	When transporting the hot water module, wear shoes with protective toe caps, protective gloves and other protective clothing.
	When connecting the electrical wires, repairing the electrical parts or undertaking other electrical jobs, wear gloves to provide protection for electricians, insulating shoes and clothing to provide protection from electric shocks. Failure to wear this protective gear may result in electric shocks.
	Electrical wiring work shall be conducted according to law and regulation in the community and installation manual. Failure to do so may result in electrocution or short circuit.
	When working at heights, use a ladder which complies with the ISO 14122 standard, and follow the procedure in the ladder's instructions. Also wear a helmet for use in industry as protective gear to undertake the work.
	When working at heights, put a sign in place so that no-one will approach the work location, before proceeding with the work. Parts and other objects may fall from above, possibly injuring a person below.
	Do not touch the plate heat exchanger of the unit. You may injure yourself if you do so. If the plate heat exchanger must be touched for some reason, first put on protective gloves and safety work clothing, and then proceed.
	Do not climb onto or place objects on top of the outdoor unit. You may fall or the objects may fall off of the outdoor unit and result in injury.
	When transporting the hot water module, wear shoes with additional protective toe caps.
	When transporting the hot water module, do not take hold of the bands around the packing carton. You may injure yourself if the bands should break.
	Be sure that a heavy unit (10 kg or heavier) such as a compressor is carried by two persons.
Check earth wires.	Before troubleshooting or repair work, check the earth wire is connected to the earth terminals of the hot water module, otherwise an electric shock is caused when a leak occurs.If the earth wire is not correctly connected, contact an electric engineer for rework
	After completing the repair or relocation work, check that the ground wires are connected properly.
	Be sure to connect earth wire. (Grounding work) Incomplete grounding causes an electric shock. Do not connect ground wires to gas pipes, water pipes, and lightning rods or ground wires for telephone wires.
Prohibition of modification.	Do not modify the products.Do not also disassemble or modify the parts. It may cause a fire, electric shock or injury.
Use specified parts.	When any of the electrical parts are to be replaced, ensure that the replacement parts satisfy the specifications given in the Service Manual (or use the parts contained on the parts list in the Service Manual). Use of any parts which do not satisfy the required specifications may give rise to electric shocks, smoking and / or a fire.
Do not bring a child close to the equipment.	If, in the course of carrying out repairs, it becomes absolutely necessary to check out the electrical parts with the electrical parts box cover of one or more of the hot water module and the service panel of the outdoor unit removed in order to find out exactly where the trouble lies, put a sign in place so that no-one will approach the work location before proceeding with the work. Third-party individuals may enter the work site and receive electric shocks if this warning is not heeded.
Insulating measures	Connect the cut-off lead wires with crimp contact, etc., put the closed end side upward and then apply a watercut method, otherwise a leak or production of fire is caused at the users f side.

No fire	When performing repairs using a gas burner, replace the refrigerant with nitrogen gas because the oil that coats the pipes may otherwise burn. When repairing the refrigerating cycle, take the following measures. 1) Be attentive to fire around the cycle. When using a gas stove, etc., be sure to put out fire before work; otherwise the oil mixed with refrigerant gas may catch fire. 2) Do not use a welder in the closed room. When using it without ventilation, carbon monoxide poisoning may be caused. 3) Do not bring inflammables close to the refrigerant cycle, otherwise fire of the welder may catch the inflammables.
Refrigerant	The refrigerant used by this hot water module is the R410A.
	Check the used refrigerant name and use tools and materials of the parts which match with it. For the products which use R410A refrigerant, the refrigerant name is indicated at a position on the outdoor unit where is easy to see. To prevent miss-charging, the route of the service port is changed from one of the former R22.
	For an hot water module which uses R410A, never use other refrigerant than R410A. For an hot water module which uses other refrigerant (R22, etc.), never use R410A. If different types of refrigerant are mixed, abnormal high pressure generates in the refrigerating cycle and an injury due to breakage may be caused.
	When the hot water module has been installed or relocated, follow the instructions in the Installation Manual and purge the air completely so that no gases other than the refrigerant will be mixed in the refrigerating cycle. Failure to purge the air completely may cause the hot water module to malfunction.
	Do not charge refrigerant additionally. If charging refrigerant additionally when refrigerant gas leaks, the refrigerant composition in the refrigerating cycle changes resulted in change of hot water module characteristics or refrigerant over the specified standard amount is charged and an abnormal high pressure is applied to the inside of the refrigerating cycle resulted in cause of breakage or injury. Therefore if the refrigerant gas leaks, recover the refrigerant in the hot water module, execute vacuuming, and then newly recharge the specified amount of liquid refrigerant. In this time, never charge the refrigerant over the specified amount.
	When recharging the refrigerant in the refrigerating cycle, do not mix the refrigerant or air other than R410A into the specified refrigerant. If air or others is mixed with the refrigerant, abnormal high pressure generates in the refrigerating cycle resulted in cause of injury due to breakage.
	After installation work, check the refrigerant gas does not leak. If the refrigerant gas leaks in the room, poisonous gas generates when gas touches to fire such as fan heater, stove or cocking stove though the refrigerant gas itself is innocuous.
	Never recover the refrigerant into the outdoor unit. When the equipment is moved or repaired, be sure to recover the refrigerant with recovering device. The refrigerant cannot be recovered in the outdoor unit; otherwise a serious accident such as breakage or injury is caused.
Assembly / Wiring	After repair work, surely assemble the disassembled parts, and connect and lead the removed wires as before. Perform the work so that the cabinet or panel does not catch the inner wires. If incorrect assembly or incorrect wire connection was done, a disaster such as a leak or fire is caused at user fs side.
Insulator check	After the work has finished, be sure to use an insulation tester set (500 V Megger) to check the resistance is 1 MΩ or more between the charge section and the non-charge metal section (Earth position). If the resistance value is low, a disaster such as a leak or electric shock is caused at user fs side.
Ventilation	When the refrigerant gas leaks during work, execute ventilation. If the refrigerant gas touches to a fire, poisonous gas generates. A case of leakage of the refrigerant and the closed room full with gas is dangerous because a shortage of oxygen occurs. Be sure to execute ventilation.
Compulsion	When the refrigerant gas leaks, find up the leaked position and repair it surely. If the leaked position cannot be found up and the repair work is interrupted, pump-down and tighten the service valve, otherwise the refrigerant gas may leak into the room. The poisonous gas generates when gas touches to fire such as fan heater, stove or cocking stove though the refrigerant gas itself is innocuous. When installing equipment which includes a large amount of charged refrigerant such as a multi hot water module in a sub-room, it is necessary that the density does not the limit even if the refrigerant leaks. If the refrigerant leaks and exceeds the limit density, an accident of shortage of oxygen is caused.
	Tighten the flare nut with a torque wrench in the specified manner. Excessive tighten of the flare nut may cause a crack in the flare nut after a long period, which may result in refrigerant leakage.
	Nitrogen gas must be used for the airtight test.
	The charge hose must be connected in such a way that it is not slack.
	For the installation / moving / reinstallation work, follow to the Installation Manual. If an incorrect installation is done, a trouble of the refrigerating cycle, water leak, electric shock or fire is caused.

Check after repair	Once the repair work has been completed, check for refrigerant leaks, and check the insulation resistance and water drainage. Then perform a trial run to check that the hot water module is running properly.
	After repair work has finished, check there is no trouble. If check is not executed, a fire, electric shock or injury may be caused. For a check, turn off the power breaker.
	After repair work (installation of front panel and cabinet) has finished, execute a test run to check there is no generation of smoke or abnormal sound. If check is not executed, a fire or an electric shock is caused. Before test run, install the front panel and cabinet.
	Be sure to fix the screws back which have been removed for installation or other purposes.
Do not operate the unit with the valve closed.	Check the following matters before a test run after repairing piping. • Connect the pipes surely and there is no leak of refrigerant. • The valve is opened. Running the compressor under condition that the valve closes causes an abnormal high pressure resulted in damage of the parts of the compressor and etc. and moreover if there is leak of refrigerant at connecting section of pipes, the air is sucked and causes further abnormal high pressure resulted in burst or injury.
Check after reinstallation	Only a qualified installer (*1) or qualified service person (*1) is allowed to relocate the hot water module. It is dangerous for the hot water module to be relocated by an unqualified individual since a fire, electric shocks, injury, water leakage, noise and / or vibration may result.
	Check the following items after reinstallation. 1) The earth wire is correctly connected. 2) The power cord is not caught in the product. 3) There is no inclination or unsteadiness and the installation is stable. If check is not executed, a fire, an electric shock or an injury is caused.
	When carrying out the pump-down work shut down the compressor before disconnecting the refrigerant pipe. Disconnecting the refrigerant pipe with the service valve left open and the compressor still operating will cause air, etc. to be sucked in, raising the pressure inside the refrigeration cycle to an abnormally high level, and possibly resulting in reputing, injury, etc.
Cooling check	When the service panel of the outdoor unit is to be opened in order for the compressor or the area around this part to be repaired immediately after the hot water module has been shut down, set the circuit breaker to the OFF position, and then wait at least 10 minutes before opening the service panel. If you fail to heed this warning, you will run the risk of burning yourself because the compressor pipes and other parts will be very hot to the touch. In addition, before proceeding with the repair work, wear the kind of insulated heat-resistant gloves designed to protect electricians.
	Take care not to get burned by compressor pipes or other parts when checking the cooling cycle while running the unit as they get heated while running. Be sure to put on gloves providing protection for electric shock and heat.
	When the service panel of the outdoor unit is to be opened in order for the fan motor, reactor, inverter or the areas around these parts to be repaired immediately after the hot water module has been shut down, set the circuit breaker to the OFF position, and then wait at least 10 minutes before opening the service panel. If you fail to heed this warning, you will run the risk of burning yourself because the fan motor, reactor, inverter heat sink and other parts will be very hot to the touch. In addition, before proceeding with the repair work, wear the kind of insulated heat-resistant gloves designed to protect electricians.
Installation	Only a qualified installer (*1) or qualified service person (*1) is allowed to install the hot water module. If the hot water module is installed by an unqualified individual, a fire, electric shocks, injury, water leakage, noise and / or vibration may result.
	Before starting to install the hot water module, read carefully through the Installation Manual, and follow its instructions to install the hot water module.
	Be sure to use the company-specified products for the separately purchased parts. Use of non-specified products may result in fire, electric shock, water leakage or other failure. Have the installation performed by a qualified installer.
	Do not supply power from the power terminal block equipped on the outdoor unit to another outdoor unit. Capacity overflow may occur on the terminal block and may result in fire.
	Do not install the hot water module in a location that may be subject to a risk of expire to a combustible gas. If a combustible gas leaks and becomes concentrated around the unit, a fire may occur.
	Install a circuit breaker that meets the specifications in the installation manual and the stipulations in the local regulations and laws.
	Install the circuit breaker where it can be easily accessed by the qualified service person (*1).
	If you install the unit in a small room, take appropriate measures to prevent the refrigerant from exceeding the limit concentration even if it leaks. Consult the dealer from whom you purchased the hot water module when you implement the measures. Accumulation of highly concentrated refrigerant may cause an oxygen deficiency accident.
	Do not place any combustion appliance in a place where it is directly exposed to the wind of hot water module, otherwise it may cause imperfect combustion.

Explanations given to user

If you have discovered that the fan grille is damaged, do not approach the outdoor unit but set the circuit breaker to the OFF position, and contact a qualified service person to have the repairs done.
Do not set the circuit breaker to the ON position until the repairs are completed.

Relocation

- Only a qualified installer (*1) or qualified service person (*1) is allowed to relocate the hot water module. It is dangerous for the hot water module to be relocated by an unqualified individual since a fire, electric shocks, injury, water leakage, noise and / or vibration may result.
- When carrying out the pump-down work shut down the compressor before disconnecting the refrigerant pipe. Disconnecting the refrigerant pipe with the service valve left open and the compressor still operating will cause air, etc. to be sucked in, raising the pressure inside the refrigeration cycle to an abnormally high level, and possibly resulting in reputing, injury, etc.

(*1) Refer to the “Definition of Qualified Installer or Qualified Service Person”

1. SUMMARIES OF PRODUCT CHARACTERISTICS

CONCEPT

- To design and produce a low temperature hot water module, capable of producing up to 50°C outlet water temperature, whilst maximizing the performance and efficiency of the entire VRF system.
- To be used in both space heating and domestic hot water applications. Typical applications include Hotel, Office and residential apartment suits.
- To create a single solution for our customers heating, cooling and domestic hot water requirements.

Toshiba SMMS-i Hot Water Module –CHARACTER

- New Design, specifically engineered for VRF application
- Operating Control designed specifically to maximize both performance and efficiency.
- Capacity line up - 8kW & 16kW
- All models come in single phase (220 – 240V ~ 50Hz)
- Maximum 50% Hot Water Module to CDU diversity (Max 2 Hot Water Module's per refrigerant system)
- Maximum system diversity 65 - 115% (including Hot Water Module)
- Outdoor operation range (-20°C WB ~ 19°C WB)

Domestic Hot Water Installation Example

Typical Installations examples include –

- Office use, where there is a requirement for DHW, such as small canteen or Rest
- Apartment block, where there is a requirement for DHW, such as kitchen, Shower and
- Hotel use, where there is an auxiliary requirement for DHW, for the purpose of cleaning and sanitary operations.
- Small Businesses, for example coffee shops, hairdressers etc, where there is a requirement for a single heating solution.

Space Heating Installation Example

Typical Installations examples include –

- Office use, where there is a requirement for space heating via fan coils or AHU's
- Apartment, where there is a requirement for space heating via under-floor heating
- Hotel use, where there is an auxiliary requirement for space heating via a combination of fan coils, AHU or under-floor heating circuits.
- Small Businesses, for example coffee shops, hairdressers etc, where there is a requirement for a single heating solution.

Connectable units

VRF products

- The outdoor unit which is connectable to "Hot Water Module" is SMMS-i .
- The system does not work when it connect to "MiNi-SMMS","SMMS(5,6HP)" and "SHRM-i".
- BMS units can not be connected with these units.

Remote controller

•RBC-ATM32E •TCB-CC163TLE2
•RBC-AMS41E •TCB-SC642TLE2 •TCB-EXS21TLE

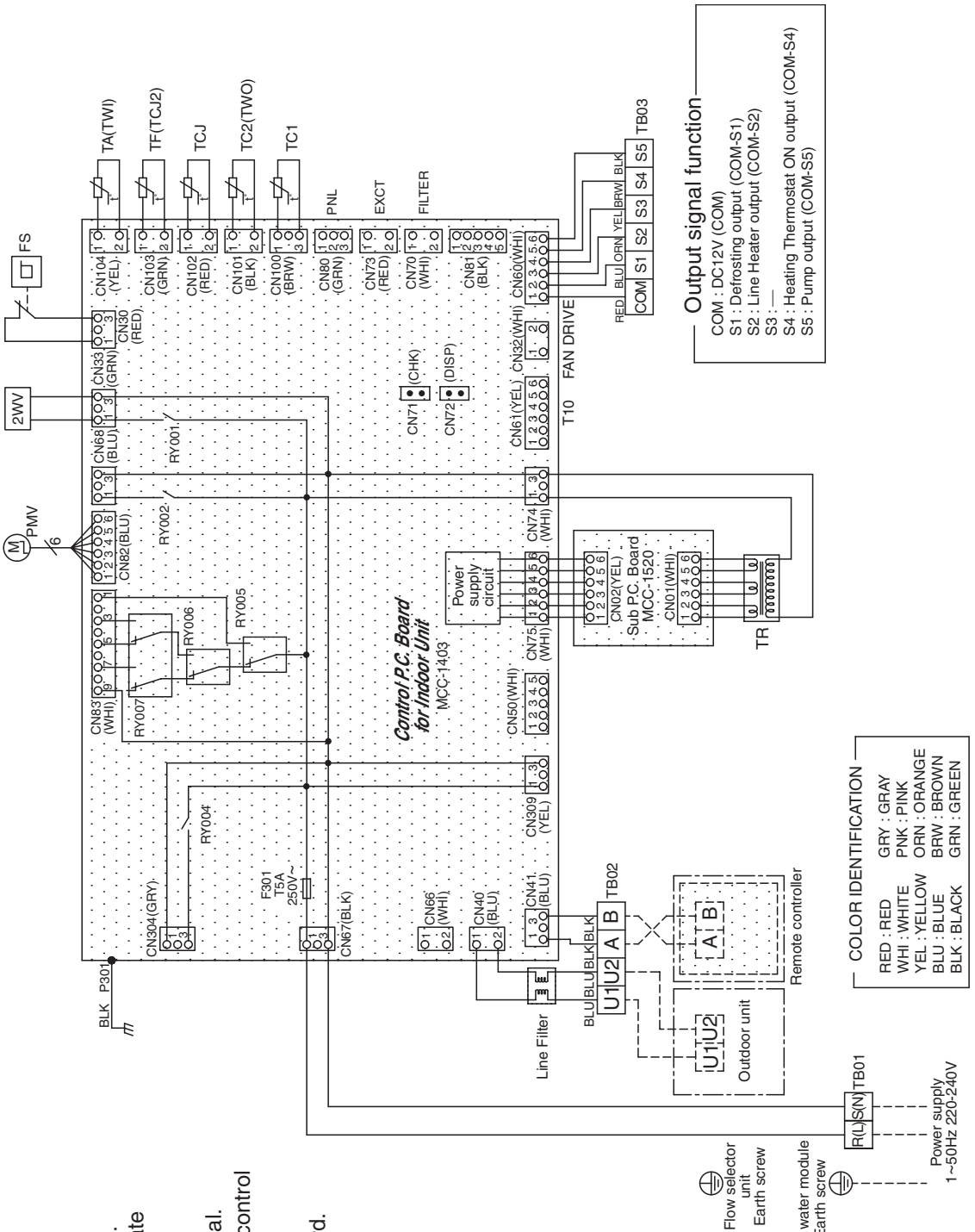
2. SPECIFICATION

Model				MMW-AP0271LQ-E	MMW-AP0561LQ-E
Heating capacity *1			(kW)	8.0	16.0
Electical characteristics	Power supply *2			1 phase 50Hz 230V (220-240V)	
	Running current		(A)	0.08	0.08
	Power consumption		(W)	14	14
Appearance				Zinc hot dipping steel plate	
Dimention	Unit	Hight	(mm)	580	
		Width (leg inclued)	(mm)	400 (467)	
		Depth	(mm)	250	
	Packed *3	Hight	(mm)	357	
		Width	(mm)	638	
		Depth	(mm)	833	
Weight	Unit		(kg)	17.8	20.3
	Packed		(kg)	23	25
Design Pressure	Refrigerant side		(Mpa)	3.73	
	Water side		(Mpa)	1.0	
Heat exchanger				Plate type heat exchanger	
Heat-insulating material				Polyethylene foam + Polyurethane foam	
Water flow rate	Standard		(L/min)	22.9	45.8
	Min.		(L/min)	19.5	38.9
Water pressure loss (at standard water flow rate)			(kPa)	40.5	44.2
Controller				Remote controller	
Operation range	Amibient	indoor	(˚CDB)	5-32	
		Allowable dew point	(˚CWB)	23 or less	
			RH(%)	30-85	
		Outdoor (at heating)	(˚CWB)	-20-19	
	Water inlet side		(˚C)	15 or more and 45 or less	
	Water outlet side		(˚C)	25-50	
Water filter				Strainer with Mesh 30 to 40 (procured locally)	
Connecting pipe	Water pipe	Inlet		R1-1/4	
		Outlet		R1-1/4	
	Refrigerat pipe	Gas pipe	(mm)	Ø15.9 flare connection	
		Liquid pipe	(mm)	Ø9.5 flare connection	
	Drain pipe			R1	
Sound pressure level			(dB(A))	25	27
Installation place				Indoor	

Model				MMW-AP0271LQ-TR	MMW-AP0561LQ-TR
Heating capacity *1			(kW)	8.0	16.0
Electical characteristics	Power supply *2			1 phase 50Hz 230V (220-240V)	
	Running current		(A)	0.08	0.08
	Power consumption		(W)	14	14
Appearance				Zinc hot dipping steel plate	
Dimention	Unit	Hight	(mm)	580	
		Width (leg inclued)	(mm)	400 (467)	
		Depth	(mm)	250	
	Packed *3	Hight	(mm)	357	
		Width	(mm)	638	
		Depth	(mm)	833	
Weight	Unit		(kg)	17.8	20.3
	Packed		(kg)	23	25
Design Pressure	Refrigerant side		(Mpa)	3.73	
	Water side		(Mpa)	1.0	
Heat exchanger				Plate type heat exchanger	
Heat-insulating material				Polyethylene foam + Polyurethane foam	
Water flow rate	Standard		(L/min)	22.9	45.8
	Min.		(L/min)	19.5	38.9
Water pressure loss (at standard water flow rate)			(kPa)	40.5	44.2
Controller				Remote controller	
Operation range	Amibient	indoor	(˚CDB)	5-32	
		Allowable dew point	(˚CWB)	23 or less	
			RH(%)	30-85	
		Outdoor (at heating)	(˚CWB)	-20-19	
	Water inlet side		(˚C)	15 or more and 45 or less	
	Water outlet side		(˚C)	25-50	
Water filter				Strainer with Mesh 30 to 40 (procured locally)	
Connecting pipe	Water pipe	Inlet		R1-1/4	
		Outlet		R1-1/4	
	Refrigerat pipe	Gas pipe	(mm)	Ø15.9 flare connection	
		Liquid pipe	(mm)	Ø9.5 flare connection	
	Drain pipe			R1	
Sound pressure level			(dB(A))	25	27
Installation place				Indoor	

*1 Rated conditions : entering condenser water temp. 30˚C leaving condenser water temp. 35˚C Outdoor air temp. 7˚CDB / 6˚CWB
The standard piping means that mian pipe length is 5m, nranching pipe length is 2.5m of branch piping connected with a 0 meter height.
*2 The source voltage must not fluctuate more than ±10%.
*3 The unit is packed in a sideways state.

3. WIRING DIAGRAMS



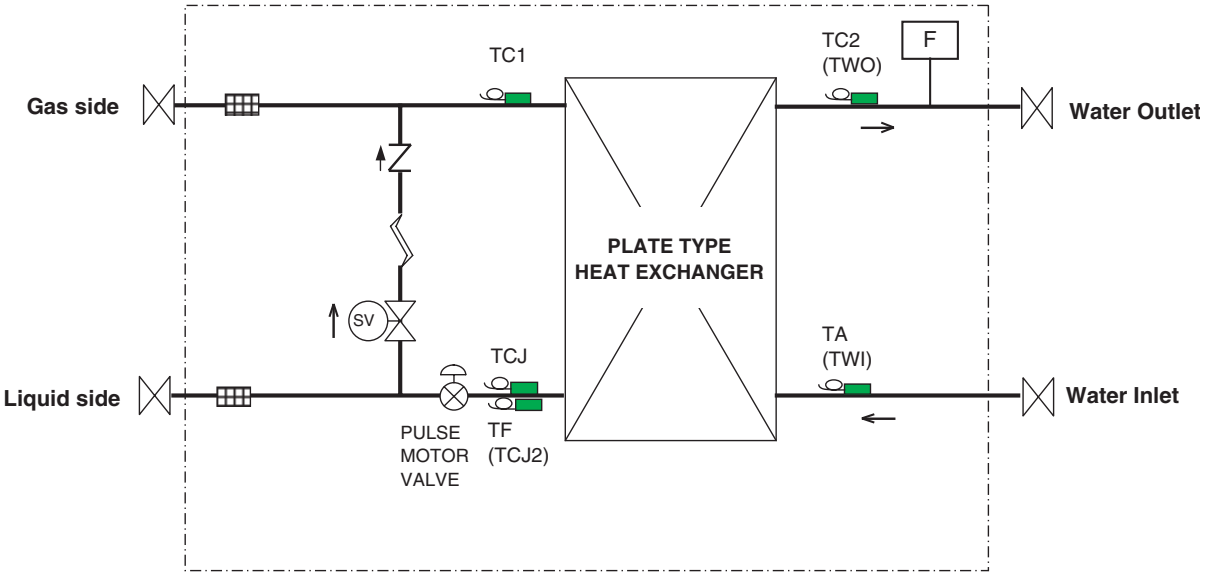
1. Broken line indicate the wiring at site.
   Long dashed short dashed line indicate the accessories.
2. ☐☐ indicates the terminal block.
   —○— indicates the connection terminal.
   ○ ○ indicates the connector on the control P.C. board.
3. ⏚ indicates the protection ground.
4. ····· indicates the control P.C. board.

Symbol	Parts Name
CN**	Connector
RY001	2Way Valve Relay
F301	Fuse
PMV	Pulse Motor Valve
TB01,02,03	Terminal Block
TC1,TCJ,TF	Temp sensor
TC2,TA	Temp sensor
TR	Transformer
2WV	2Way Valve
FS	Flow Switch

4. PARTS RATING

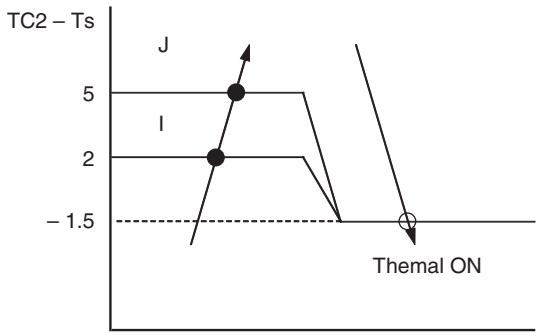
Model MMW-	AP0271LQ-E	AP0271LQ-TR	AP0561LQ-E	AP0561LQ-TR
Transformer	TT-13			
Flow switch	VK320M, Cap color Blue		VK320M, Cap color Black	
Pulse motor	EFM-MD12TF-1			
Pulse motor valve	EDM-B40YGTF-3		EDM-B60YGTF-1	
2 way valve coil	FQ-G593, AC220-240V 50/60Hz, Lead wire length 800 mm			
2 way valve body	FDF2A88			
TA (TWI) sensor	Ø6 size lead wire length:1200 mm Vinyl tube (Black), connector color Yellow			
TC1 sensor	Ø4 size lead wire length:1200 mm Vinyl tube (Blue), connector color Brown			
TC2 (TWO) sensor	Ø6 size lead wire length:1200 mm Vinyl tube (Black), connector color Black			
TCJ sensor	Ø6 size lead wire length:1200 mm Vinyl tube (Red), connector color Red			
TF (TCJ2) sensor	Ø6 size lead wire length:1000 mm Vinyl tube (Gray), connector color Green			

5. REFRIGERANT CYCLE DIAGRAM



Symbol	SV		Z			F
	Solenoid valve	Capillary tube	Check valve	Strainer	Tempe. sensor	Flow switch

6. CONTROL OUTLINE

<table>
<tr><th>No.</th><th>Item</th><th>Specification</th><th>Remarks</th></tr>
<tr><td>1</td><td>Upon power supply reset</td><td>1. Identification of outdoor unit
When the power supply is reset, the outdoor unit is identified, and control is redirected according to the identification result.
2. Indoor fan speed and air flow direction control availability settings
Settings such as indoor fan speed and air flow direction control availability are replaced on the basis of EEPROM data.
3. If power supply reset is performed in the wake of a fault, the check code is cleared.
If the abnormality persists after the Start / Stop button on the remote controller is pushed to resume operation, the check code is redisplayed on the remote controller.</td><td></td></tr>
<tr><td>2</td><td>Operation selection</td><td>1. The operation mode changes in response to an operation selection command issued via the remote controller.
<table><tr><th>Remote controller command</th><th>Control outline</th></tr><tr><td>STOP</td><td>Hot water module shutdown</td></tr><tr><td>HEAT</td><td>Heating operation</td></tr></table></td><td>Ts: Temperature setting
TA: Water inlet temperature</td></tr>
<tr><td>3</td><td>Water outlet temperature control</td><td>1. Adjustment range - remote controller temperature setting (˚C)
<table><tr><th></th><th>HEAT</th></tr><tr><td>Wired type</td><td>25~50</td></tr></table></td><td></td></tr>
<tr><td>4</td><td>Water temperature control</td><td>After heating start, water temperature is controled the follwing tasks;
Themal OFF with the following conditions.
1) I zone continued for 10 minutes.
2) The zone become J zone.
3) When TS=TA
4) When state TA ≥ 45˚C continued for 1 minute, or state TA ≥ 44˚C and TC2 ≥ 46˚C continued for 1 minute
 
</td><td>TC2: Water outlet temperature
Ts: Temperature setting
TA: Water inlet temperature</td></tr>
</table>

<table>
<tr><th>No.</th><th>Item</th><th>Specification</th><th>Remarks</th></tr>
<tr><td>5</td><td>Heater control</td><td>1. While the heating themal ON, the heater relay is output by difference between Ts and TA, and difference between Ts and TC2, Ts and TG.

Start condition: A and B as shown on the right, Table 1 or Table 2
Release condition: A or B as shown on the right, Table 1 or Table 2

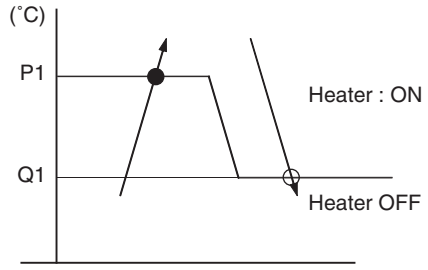
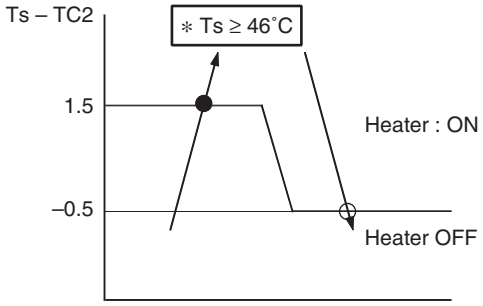
 

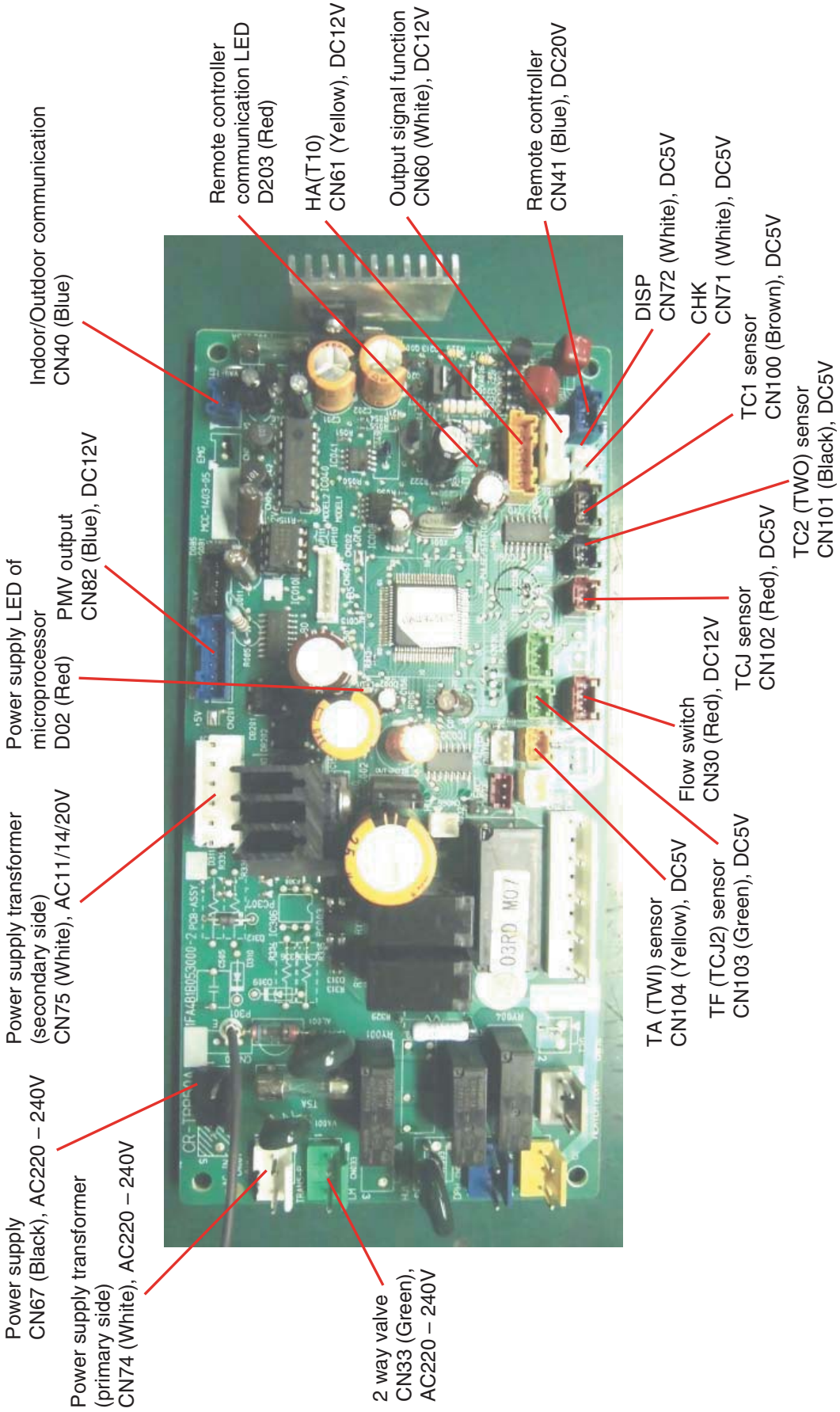
Table 1
<table>
<tr><th></th><th>Ts – TA (A)</th><th>Ts – TC2 (B)</th></tr>
<tr><td>P1</td><td>7˚C</td><td>2˚C</td></tr>
<tr><td>Q1</td><td>5˚C</td><td>0˚C</td></tr>
</table>
Table 2
<table>
<tr><th></th><th>Ts – TC2 (A)</th><th>Ts – TG (B)</th></tr>
<tr><td>P1</td><td>2˚C</td><td>–11˚C</td></tr>
<tr><td>Q1</td><td>0˚C</td><td>–14˚C</td></tr>
</table>
2. In case of Ts > 45˚C, the heater relay is output as shown below by the difference between Ts and TC2.
 
</td><td>Ts: Temperature setting
TC2: Water outlet temperature
TG: Satisfaction temperature of discharge pressure</td></tr>
<tr><td>6</td><td>Water Heat exchanger frost prevention</td><td>As the following description, the pump heater is controlled based upon the detected temperature of TC1 sensor, TCJ sensor, TF sensor, TC2 sensor, and TA sensor, regardless of Start/Stop operation.
1) Pump ON condition
(1) When any one of temperature of TC1 sensor, TCJ sensor, TF sensor, TC2 sensor or TA sensor decreased below 5˚C
(2) When TC1 < 10˚C and TCJ-TC1 ≥ 5˚C
2) Pump OFF condition
When all the temperature of TC1 sensor, TCJ sensor, TF sensor, TC2 sensor, and TA sensor increased above 12˚C
3) Heater ON condition
(1) When 65 seconds progressed after the pump was OFF, TA or TC2 decreased below 15˚C
4) Heater OFF condition
The state TA or TC2 ≥ 15˚C continued for 2 minutes or more.</td><td>TC1: Gas Temperature
TCJ: Liquid
(TF) Temperature</td></tr>
<tr><td>7</td><td>Cooling oil (refrigerant) recovery control</td><td>While the outdoor unit is recovering cooling oil (refrigerant), the hot water modules perform the following control tasks:
1) Close the hot water module PMV to a certain degree.
2) Engage in recovery control for a specified period of time and return to stand by at the end of this period upon terminating the control.
3) Open the SV valve throughout the recovery control period.</td><td>• Recovery operation normally takes place roughly every 2 hours.</td></tr>
<tr><td>8</td><td>Heating refrigerant (oil) recovery control</td><td>While the outdoor unit is recovering heating refrigerant (oil), the hot water modules perform the following control tasks:
1) Open the indoor PMV to a certain degree.
2) Control the indoor fan according to the operation mode.
Indoor units operating in heating thermo ON / OFF state]
Non-operational hot water modules]
3) Terminate the recovery operation depending on the TC2 temperature reading.
The timing of termination is determined by each indoor unit.</td><td>• Recovery operation normally takes place roughly every hour.
• The opening position of the hot water module PMV depending on capacity of the hot water modules.</td></tr>
</table>

<table>
<tr><th>No.</th><th>Item</th><th>Specification</th><th>Remarks</th></tr>
<tr><td>9</td><td>Defrosting control</td><td>While the outdoor unit is engaged in defrosting control, thehot water modules perform the following control tasks:
1) Close the hot water module PMV to a certain degree and open the SV valve. As defrosting control comes to an end, it gives way to heating refrigerant (oil) recovery control.
(For control details, see “Heating refrigerant (oil) recovery control” above.)</td><td>• For defrosting commencement conditions, see 5 Control Outline “7. Defrosting control (reverse defrosting method)” in SMMS-i Outdoor Unit Service Manual A10-005 above.</td></tr>
<tr><td>10</td><td>Short intermittent operation compensation control</td><td>1. For 5 minutes after startup, the system is forced to continue operating even if it reaches the thermo OFF region.
2. However, priority is given to cooling / heating selection, operation standby, and protective control, so that there is no overriding of thermo OFF in these cases.</td><td></td></tr>
<tr><td>11</td><td>Operation standby
Heating standby</td><td><Operation standby> ..... Displayed on remote controller
1. When any of the DN codes listed below is displayed
• “P05” - Detection of an open phase in the power supply wiring
• “P10” - Detection of indoor flooding in at least one indoor unit with the exception of the hot water module.
• “L30” - Detection of an interlock alarm in at least one indoor unit
2. The system is engaged in a heat refrigerant (oil) recovery operation.
<Heating standby> ..... Displayed on remote controller
1. Normal thermo OFF
• During heating, the indoor unit goes thermo OFF as the heating temperature setting is reached.
2. Forced thermo OFF
• “HEAT” operation is unavailable because at least one indoor unit is operating in “COOL / DRY” mode .</td><td>• “OPERATION STANDBY ⏻” displayed
• “HEATING STANDBY ☼” displayed</td></tr>
<tr><td>12</td><td>Selection of central control mode</td><td>1. The range of operations that can be performed via an indoor unit remote controller can be determined through the setting of the central controller.
2. Setting details
TCC-Link central control
<table>
<tr><th rowspan="2">Operation via TCC-Link central control</th><th colspan="6">Operation via RBC-AMT32E</th><th rowspan="2">RBC-AMT32E display</th></tr>
<tr><th>Start / stop selection</th><th>Operation mode selection</th><th>Timer setting</th><th>Temperature setting</th><th>Fan speed setting</th><th>Air flow direction setting</th></tr>
<tr><td>Individual</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td rowspan="5">“CENTRAL CONTROL IN PROGRESS”</td></tr>
<tr><td>Central 1</td><td>×</td><td>O</td><td>×</td><td>O</td><td>O</td><td>O</td></tr>
<tr><td>Central 2</td><td>×</td><td>×</td><td>×</td><td>×</td><td>O</td><td>O</td></tr>
<tr><td>Central 3</td><td>O</td><td>×</td><td>O</td><td>×</td><td>O</td><td>O</td></tr>
<tr><td>Central 4</td><td>O</td><td>×</td><td>O</td><td>O</td><td>O</td><td>O</td></tr>
</table>
(O: Accessible ×: Inaccessible)</td><td>• In the case of a wired remote controller, “CENTRAL CONTROL IN PROGRESS” is displayed (lit up) while in central control mode.
• The display blinks when a control function inaccessible to a remote controller is chosen.</td></tr>
</table>

7. APPLIED CONTROL AND FUNCTIONS

7-1. Hot Water Module printed circuit board

MCC-1403



7-2. Optional connector specifications of hot water module P.C. board

Function	Connector No.	Pin No.	Specification	Remarks
HA	CN61	1	Start / stop input	Start / stop input for HA (J01: In place / Removed = Pulse input (factory default) / Step input)
		2	0 V (COM)	—
		3	Remote controller disabling input	Enables / disables start / stop control via remote controller
		4	In-operation output	ON during operation (HA answerback signal)
		5	DC12 V (COM)	—
		6	Alarm output	ON while alarm ON
Option output (*1)	CN60	1	DC12V(COM)	—
		2	Defrosting output	ON while outdoor unit ON
		3	Heater output	—
		4	—	—
		5	Heating thermostat output	ON while heating thermostat ON (compresor ON)
		6	Pump output	—
External error input	CN80	1	DC12 V (COM)	Generates test code L30 and automatically shuts down air conditioner (only if condition persists for 1 minute)
		2	DC12 V (COM)	
		3	External error input	
CHK Operation check	CN71	1	Check mode input	Used for hot water module operation check (prescribed operational status output, such as indoor PMV ON, to be generated without communication with outdoor unit or remote controller)
		2	0 V	
DISP Display mode	CN72	1	Display mode input	Product display mode - Communication just between hot water module and remote controller enabled (upon turning on of power) Timer short-circuited out (always)
		2	Display mode input	

(*1) For hot water module, terminal block of option output (CN 60) is equipped in the hot water module. Refer to **3. WIRING DIAGRAM**.

7-3. Test operation of hot water module unit

▼ Check function for operation of hot water module (Functions at hot water module side)

This function is provided to check the operation of the hot water module singly without communication with the remote controller or the outdoor unit. This function can be used regardless of operation or stop of the system. However, if using this function for a long time, a trouble of the equipment may be caused. Limit using this function within several minutes.

[How to operate]

1) Short-circuit CHK pin (CN71 on the hot water module P.C. board).
   The operation mode differs according to the hot water module status in that time.
   Normal time: Both float SW and fan motor are normal.
   Abnormal time: Either one of float SW or fan motor is abnormal.
2) Restricted to the normal time, if short-circuiting DISP pin (CN72 on the hot water module P.C. board) in addition to short-circuit of CHK pin (CN71 on the hot water module P.C. board), the minimum opening degree (30 pls) can be set to the hot water module PMV only.
   When open DISP pin, the maximum opening degree (1500 pls) can be obtained again.

[How to clear]

Open CHK pin. While the system is operating, it stops once but automatically returns to operation after several minutes.

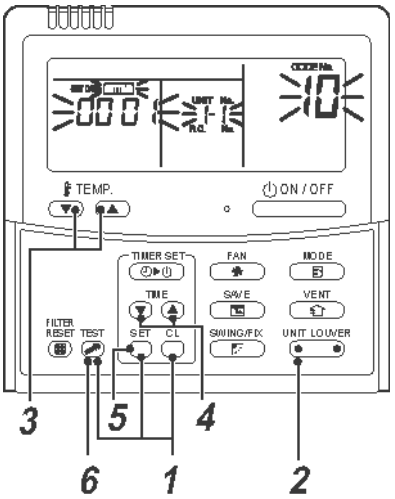
	Short-circuit of CHK pin		
	Normal time		**Abnormal time**
	DISP pin open	**DISP pin short circuit**	
Fan motor	(H)	(H)	Stop
Hot water module PMV (*)	Max. opening degree (1500 pls)	Min. opening degree (30 pls)	Min. opening degree (30 pls)
Communication	All ignored	All ignored	All ignored
P.C. board LED	Lights	Lights	Flashes

- To exchange the hot water module PMV coil, set the hot water module PMV to Max. opening degree.
- For the detailed positions of CHK pin (CN71 on hot water module P.C. board) and DISP pin (CN72 on hot water module P.C. board), refer to the hot water module P.C. board MCC-1403.

7-4. Method to set hot water module function DN code

(When performing this task, be sure to use a wired remote controller.)

<Procedure> To be performed only when system at rest



1 **Push the TEST + SET + CL buttons simultaneously and hold for at least 4 seconds.**

The unit No. displayed first is the address of the header indoor unit (including Hot Water Module) in group control.

2 **Each time the "Select unit" side of the UNIT LOUVER button is pushed, one of the indoor unit (including Hot Water Module) No. under group control is displayed in turn.**

3 **Use the TEMP. button to select the CODE No. (DN code) of the desired function.**

4 **Use the TIME button to select the desired SET DATA associated with the selected function.**

5 **Push the SET button. (The display changes from flashing to steady.)**

- To change the selected hot water module, go back to step ***2***.
- To change the selected function, go back to step ***3***.

6 **When the SET button is pushed, the system returns to normal off state.**

NOTE: In case of the hot water module, remove the front panel so that P.C. board is visible and then check the D02 LED at the center of P.C. board goes on to judge whether DN is being set or not. The LED goes on while DN code is being set.

Function CODE No. (DN Code) table (includes all functions needed to perform applied control on site)

DN	Item	Description			At shipment
03	Central control address	0001: No.1 unit 0099: Unfixed	to	0064: No.64 unit	0099: Unfixed
10	Type	0060: Hot Water Module * refer to Type CODE No. [10]			Depending on model type
11	Indoor unit capacity	0000: Unfixed	to	0001 to 0040	According to capacity type
12	Line address	0001: No.1 unit	to	0030: No.30 unit	0099: Unfixed
13	Indoor unit address	0001: No.1 unit	to	0064: No.64 unit	0099: Unfixed
14	Group address	0000: Individual 0002: Follower unit of group		0001: Header unit of group	0099: Unfixed
28	Automatic restart of power failure	0000: None		0001: Restart	0000: None
2E	HA terminal (CN61) select	0000: Usual 0002: Fire alarm input		0001: Leaving-ON prevention control	0000: Usual (HA terminal)
60	Timer setting (wired remote controller)	0000: Available (can be performed)		0001: Unavailable (cannot be performed)	0000: Available

Type
DN code "10"

Value	Type	Model
0060*	Hot Water Module	MMW-AP✻✻✻✻LQ

* Default value stored in EEPROM mounted on service P.C. board

Indoor Unit Capacity
DN code "11"

Value	Capacity
0000*	Invalid
0011	027 type
0017	056 type

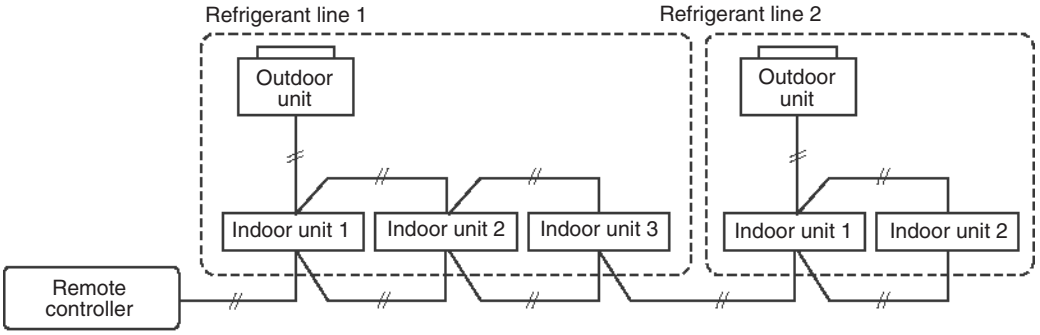
*1 Default value stored in EEPROM mounted on service P.C. board

7-5. Applied control of indoor unit (including Hot Water Module)

Manual address setting using the remote controller

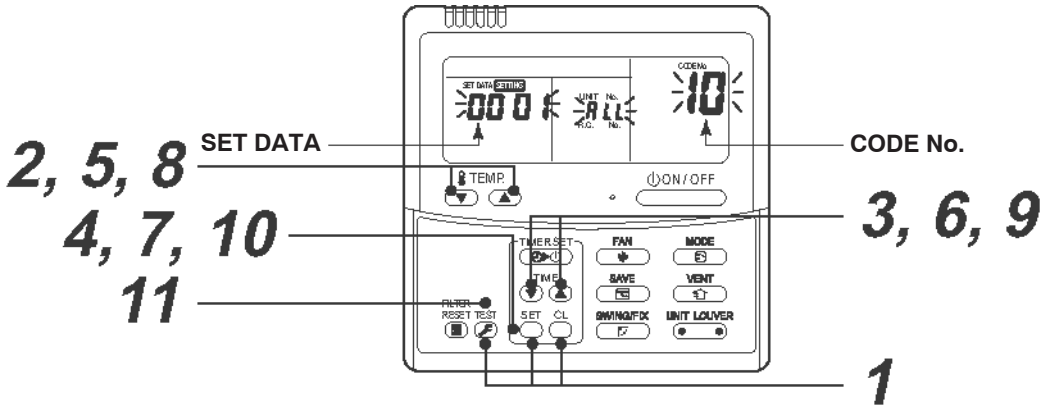
Procedure when setting indoor units' addresses first under the condition that indoor wiring has been completed and outdoor wiring has not been started (manual setting using the remote controller)

▼ Wiring example of 2 refrigerant lines



Line (system) address	1	1	1		2	2
Indoor unit address	1	2	3		1	2
Group address	1 Header unit	2 Follower unit	2 Follower unit		2 Follower unit	2 Follower unit

In the example above, disconnect the remote controller connections between the indoor units and connect a wired remote controller to the target unit directly before address setting.



Pair the indoor unit to set and the remote controller one-to-one.

Turn on the power.

1 **Push and hold the SET, CL, and TEST buttons at the same time for more than 4 seconds.**
LCD starts flashing.

<Line (system) address>

2 **Push the TEMP. ▼ / ▲ buttons repeatedly to set the CODE No. to 12.**

3 **Push the TIME ▼ / ▲ buttons repeatedly to set a system address.**
(Match the address with the address on the interface P.C. board of the header outdoor unit in the same refrigerant line.)

4 **Push SET button.**
(It is OK if the display turns on.)

<Indoor unit address>

5 **Push the TEMP. ▼ / ▲ buttons repeatedly to set the CODE No. to 13.**

6 **Push the TIME ▼ / ▲ buttons repeatedly to set an indoor unit address.**

7 **Push the SET button.**
(It is OK if the display turns on.)

<Group address>

8 **Push the TEMP. ▼ / ▲ buttons repeatedly to set the CODE No. to 14.**

9 **Push the TIME ▼ / ▲ buttons repeatedly to set a group address. If the indoor unit is individual, set the address to 0000 ; header unit, 0001 ; follower unit, 0002 .**

10 **Push the SET button.**
(It is OK if the display turns on.)

11 **Push the TEST button.**
The address setting is complete.
(SETING flashes. You can control the unit after SETING has disappeared.)

NOTE

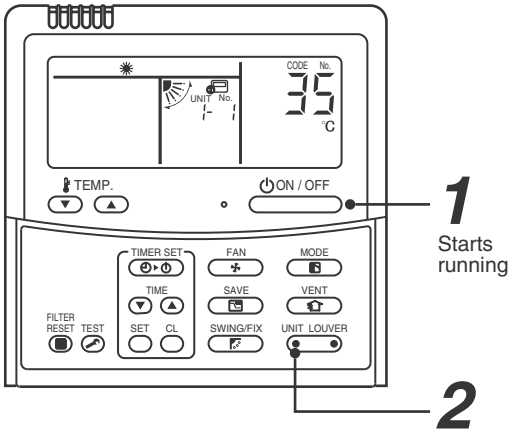
1. **Do not use address numbers 29 or 30 when setting system addresses using the remote controller.**
   These 2 address numbers cannot be used on outdoor units and the CODE No. [E04] (Indoor / outdoor communication error) will appear if they are mistakenly used.
2. **If you set addresses to indoor units in 2 or more refrigerate lines manually using the remote controller and will control them centrally, set the header outdoor unit of each line as below.**
   - Set a system address for the header outdoor unit of each line with SW13 and 14 of their interface P.C. boards.
   - Turn off dip switch 2 of SW30 on the interface P.C. boards of all the header outdoor units connected to the same central control, except the unit that has the lowest address. (For unifying the termination of the wiring for the central control of indoor and outdoor units)
   - Connect the relay connectors between the [U1, U2] and [U3, U4] terminals on the header outdoor unit of each refrigerate line.
   - After finishing all the settings above, set the address of the central control devices. (For the setting of the central control address, refer to the installation manuals of the central control devices.)
3. **In case of the hot water module, remove the front panel so that P.C. board is visible and then check the DO2 LED at the center of P.C. board goes on to judge whether DN is being set or not.**
   The LED goes on while DN code is being set.

Confirming the indoor unit addresses and the position of an indoor unit using the remote controller

◆ Confirming the numbers and positions of indoor units

To see the indoor unit address of an indoor unit which you know the position of

▼ When the unit is individual (the indoor unit is paired with a wired remote controller one-to-one), or it is a group-controlled one.



(Execute it while the units are running.)

1 **Push the ON / OFF button if the units stop.**

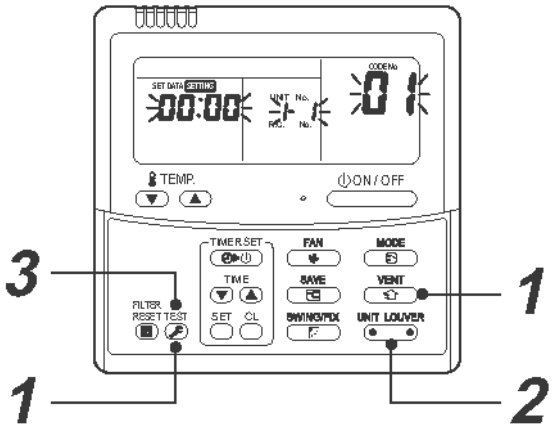
2 **Push the UNIT LOUVER button (left side of the button).**

A unit numbers 1- 1 is indicated on the LCD (it will disappear after a few seconds). The indicated number shows the system address and indoor unit address of the unit.
When 2 or more indoor units are connected to the remote controller (group-controlled units), a number of other connected units appears each time you push the UNIT LOUVER button (left side of the button).

NOTE: The LED on the P.C. board of the selected hot water module flashes. The hot water module for change settings can be confirmed.

To find an indoor unit's position from its address

▼ When checking unit numbers controlled as a group



(Execute it while the units are stopped.)

The indoor unit numbers in a group are indicated one after another. The fan and louvers of the indicated units are activated.

1 **Push and hold the VENT and TEST buttons at the same time for more than 4 seconds.**

- ALL appears on UNIT No. on the LCD display.
- The fans and louvers of all the indoor units in the group are activated.

2 **Push the UNIT LOUVER button (left side of the button). Each time you push the button, the indoor unit numbers are indicated one after another.**

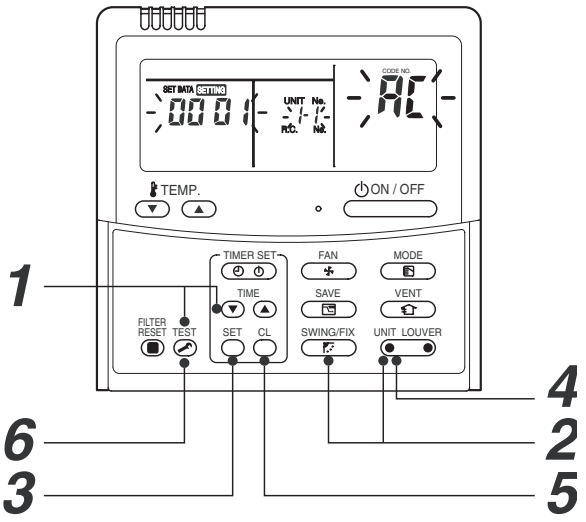
- The first-indicated unit number is the address of the header unit.
- Only the fan and louvers of the indicated indoor unit are activated.

3 **Push the TEST button to finish the procedure.**

All the indoor units in the group stop.

NOTE: The LED on the P.C. board of the selected hot water module flashes. The hot water module for change settings can be confirmed.

▼ To check all the indoor unit addresses using an arbitrary wired remote controller. (When communication wirings of 2 or more refrigerant lines are interconnected for central control)



(Execute it while the units are stopped.)

You can check indoor unit addresses and positions of the indoor units in a single refrigerant line.
When an outdoor unit is selected, the indoor unit numbers of the refrigerant line of the selected unit are indicated one after another and the fan and louvers of the indicated indoor units are activated.

1 **Push and hold the TIME ▼ and TEST buttons at the same time for more than 4 seconds. At first, the line 1 and CODE No. AC (Address Change) are indicated on the LCD display. (Select an outdoor unit.)**

2 **Push the UNIT LOUVER (left side of the button) and SWING/FIX buttons repeatedly to select a system address.**

3 **Push the SET button to confirm the system address selection.**

- The address of an indoor unit connected to the selected refrigerant line is indicated on the LCD display and its fan and louvers are activated.

4 **Push the UNIT LOUVER button (left side of the button). Each time you push the button, the indoor unit numbers of the selected refrigerant line are indicated one after another.**

- Only the fan and louvers of the indicated indoor unit are activated.

◆ To select another system address

5 **Push the CL button to return to step *2*.**

- After returning to step *2*, select another system address and check the indoor unit addresses of the line.

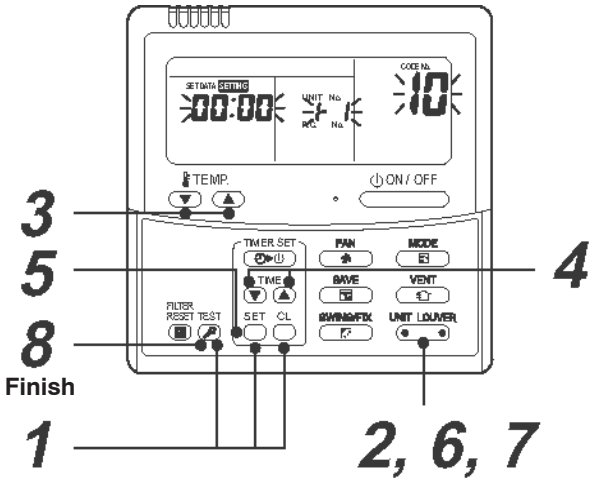
6 **Push the TEST button to finish the procedure.**

NOTE: The LED on the P.C. board of the selected hot water module flashes. The hot water module for change settings can be confirmed.

◆ Changing the indoor unit address using a remote controller

To change an indoor unit address using a wired remote controller.

▼ The method to change the address of an individual indoor unit (the indoor unit is paired with a wired remote controller one-to-one), or an indoor unit in a group. (The method is available when the addresses have already been set automatically.)



(Execute it while the units are stopped.)

1 **Push and hold the SET, CL, and TEST buttons at the same time for more than 4 seconds.**
(If 2 or more indoor units are controlled in a group, the first indicated UNIT No. is that of the head unit.)

2 **Push the UNIT LOUVER button (left side of the button) repeatedly to select an indoor unit number to change if 2 or more units are controlled in a group. (The fan and louvers of the selected indoor unit are activated.)**
(The fan of the selected indoor unit is turned on.)

3 **Push the TEMP. ▼ / ▲ buttons repeatedly to select 13 for CODE No..**

4 **Push the TIME ▼ / ▲ buttons repeatedly to change the value indicated in the SET DATA section to that you want.**

5 **Push the SET button.**

6 **Push the UNIT LOUVER button (left side of the button) repeatedly to select another indoor UNIT No. to change.**
Repeat steps ***4*** to ***6*** to change the indoor unit addresses so as to make each of them unique.

7 **Push the UNIT LOUVER button (left side of the button) to check the changed addresses.**

8 **If the addresses have been changed correctly, push the TEST button to finish the procedure.**

NOTE: The LED on the P.C. board of the selected hot water module flashes. The hot water module for change settings can be confirmed.

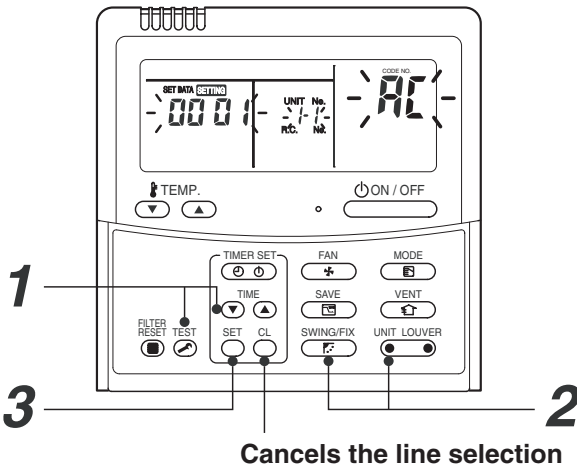
▼ To change all the indoor unit addresses using an arbitrary wired remote controller. (The method is available when the addresses have already been set automatically.)

(When communication wirings of 2 or more refrigerant lines are interconnected for central control)

NOTE

You can change the addresses of indoor units in each refrigerant line using an arbitrary wired remote controller.

* Enter the address check / change mode and change the addresses.



If no number appears on UNIT No., no outdoor unit exists on the line. Push CL button and select another line following step **2**.

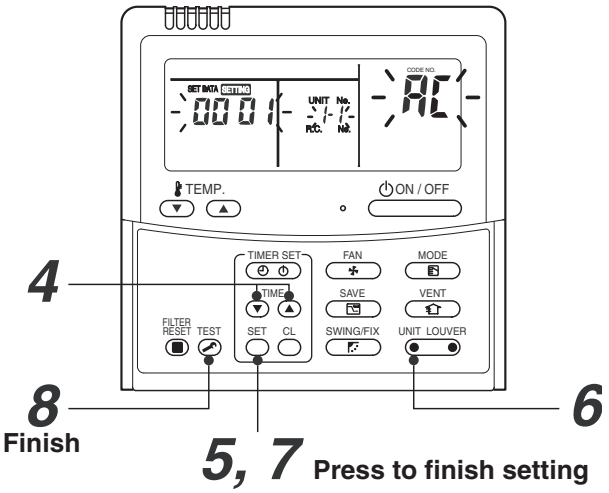
(Execute it while the units are stopped.)

1 Push and hold the TIME ▼ / ▲ buttons at the same time for more than 4 seconds. At first, the line 1 and CODE No. AC (Address Change) are indicated on the LCD display.

2 Push UNIT LOUVER (left side of the button) and SWING/FIX buttons repeatedly to select a system address.

3 Push the SET button.

- The address of one of the indoor units connected to the selected refrigerant line is indicated on the LCD display and the fan and louvers of the unit are activated.
  At first, the current indoor unit address is displayed in SET DATA.
  (No system address is indicated.)



4 **Push the TIME ▼ / ▲ buttons repeatedly to change the value of the indoor unit address in SET DATA.**
Change the value in SET DATA to that of a new address.

5 **Push the SET button to confirm the new address on SET DATA.**

6 **Push the UNIT LOUVER button (left side of the button) repeatedly to select another address to change.**
Each time you push the button, the indoor unit numbers in a refrigerant line are indicated one after another. Only the fan and louvers of the selected indoor unit are activated.
Repeat steps ***4*** to ***6*** to change the indoor unit addresses so as to make each of them unique.

7 **Push the SET button.**
(All the segments on the LCD display light up.)

8 **Push the TEST button to finish the procedure.**

NOTE: The LED on the P.C. board of the selected hot water module flashes. The hot water module for change settings can be confirmed.

◆ Error clearing function

How to clear the error using the wired remote controller

▼ Clearing an error of the outdoor unit
Clear the currently detected outdoor unit for each refrigerant line to which the indoor unit controlled by the remote controller is connected. (The indoor unit error is not cleared.)
Use the service monitoring function of the remote controller.

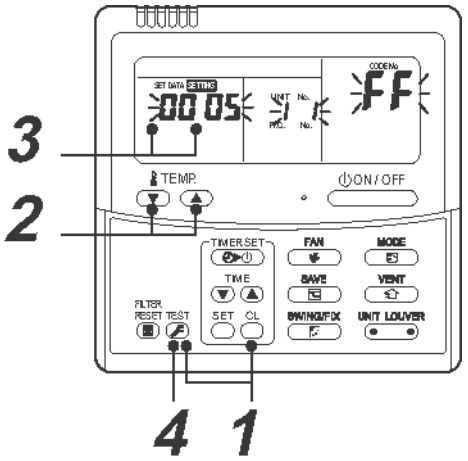
1 **Push and hold the CL, and TEST for 4 seconds or longer to enter the service monitoring mode.**

2 **Push the TEMP. button to set CODE No. to " FF ".**

3 **The display in A of the following figure counts down as follows at 5-second intervals:**
" 0005 " → " 0004 " → " 0003 " → " 0002 " → " 0001 " → " 0000 ".

The error is cleared when " 0000 " appears.
However, the display counts down from " 0005 " again.

4 **Push the TEST to return the display to normal.**

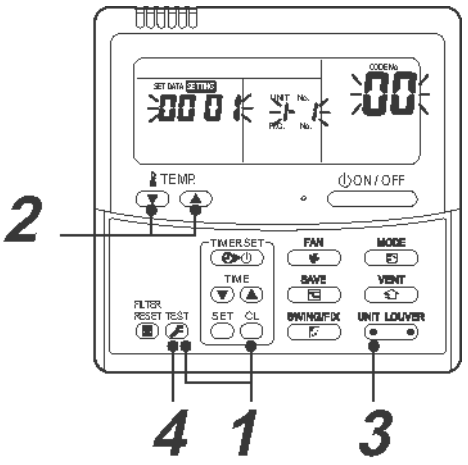


▼ Clearing an error of the indoor unit
Push the ON / OFF button on the remote controller.
(Only the error of the indoor unit controlled by the remote controller will be cleared.)

NOTE: The LED on the P.C. board of the selected hot water module flashes. The hot water module for change settings can be confirmed.

◆ Monitoring function of wired remote controller

The following monitoring function is available if the remote controller of RBC-ATM32E is used.



▼ Content

Enter the service monitoring mode using the remote controller to check the sensor temperature or operation status of the remote controller, indoor unit, and outdoor unit.

1 **Push and hold the TEST, and CL for 4 seconds or longer to enter the service monitoring mode. The service monitor lights up. The temperature of CODE No. 00 appears at first.**

2 **Push the TEMP. button to change to CODE No. of the item to monitor. Refer to the following table for CODE No.**

3 **Push the UNIT LOUVER button (left side of the button) to change to the item to monitor. Monitor the sensor temperature or operation status of the indoor unit and outdoor unit in the refrigerant line**

4 **Push the TEST to return the display to normal.**

NOTE: The LED on the P.C. board of the selected hot water module flashes. The hot water module for change settings can be confirmed.

◆ Target outdoor unit (SMMS-i – Series 4) for hot water module

	CODE No.	Data	Format	Unit	Remote controller display example
Hot water module *2	00	Water inlet temperature (in control)	×1	˚C	[0024]=24 ˚C
	02	Water inlet Temperature (TA)	×1	˚C	
	03	Heat exchanger Temperature (TCJ)	×1	˚C	
	04	Water outlet Temperature (TC2)	×1	˚C	
	05	Heat exchanger Temperature (TC1)	×1	˚C	
	06	Heat exchanger temperature (TF) *1	×1	˚C	
	08	PMV	×1/10	pls	[0150]=1500 pls
	F9	Air Suction Temperature of direct expansion coil (TSA) *1	×1	˚C	[0024]=24 ˚C
	FA	Outdoor Air Temperature (TOA) *1	×1	˚C	
System data	0A	Number of connected indoor units	×1	–	[0048]=48
	0B	Total horse power of connected indoor units	×10	HP	[0415]=41.5HP
	0C	Number of connected outdoor units	×1	–	[0004]=4
	0D	Total horse power of outdoor units	×10	HP	[0420]=42HP

	CODE No.				Data	Format	Unit	Remote controller display example
	U1	U2	U3	U4				
Individual data 1 of outdoor unit *3	10	20	30	40	Detection pressure of high-pressure sensor (Pd)	×100	MPa	[0123]=1.23 MPa
	11	21	31	41	Detection pressure of low-pressure sensor (Ps)	×100	MPa	
	12	22	32	42	Discharge temperature of compressor 1 (Td1)	×1	˚C	[0024]=24 ˚C
	13	23	33	43	Discharge temperature of compressor 2 (Td2)	×1	˚C	
	14	24	34	–	Discharge temperature of compressor 3 (Td3)	×1	˚C	
	15	25	35	45	Suction Temperature (TS)	×1	˚C	
	16	26	36	46	Coil Temperature 1 (TE1)	×1	˚C	
	17	27	37	–	Coil Temperature 2 (TE2)	×1	˚C	
	18	28	38	48	Liquid Temperature (TL)	×1	˚C	
	19	29	39	49	Outdoor Temperature (TO)	×1	˚C	
	1A	2A	3A	4A	PMV1 + 2	×1	pls	[0050]=500 pls
	1B	2B	3B	–	PMV4	×1	pls	
	1C	2C	3C	4C	Current of compressor 1 (I1)	×10	A	[0135]=13.5 A
	1D	2D	3D	4D	Current of compressor 2 (I2)	×10	A	
	1E	2E	3E	–	Current of compressor 3 (I3)	×10	A	
	1F	2F	3F	4F	Outdoor fan current (IFan)	×10	A	

*1 The TF/TSA/TOA sensors are equipped only with some types of indoor units. The data does not appear for other types.

*2 In the case of group connection, only the header indoor unit data can be displayed.

*3 The upper digit of CODE No. indicates the outdoor unit No.

*4 [(The upper digit of CODE No.) – 4] indicates the outdoor unit No.
1∗, 5∗... U1 outdoor unit (Header unit)
2∗, 6∗ ... U2 outdoor unit (follower unit 1)
3∗, 7∗ ... U3 outdoor unit (follower unit 2)
4∗, 8∗ ... U4 outdoor unit (follower unit 3)

*5 Only CODE No. 5∗ of U1 outdoor unit (Header unit) is displayed.

	CODE No.				Data	Format	Unit	Remote controller display example
	U1	U2	U3	U4				
Individual data 2 of outdoor unit *4	50	60	70	80	Rotation of compressor 1	×10	rps	[0642]=64.2 rps
	51	61	71	81	Rotation of compressor 2	×10	rps	
	52	62	72	–	Rotation of compressor 3	×10	rps	
	53	63	73	83	Outdoor fan mode	×1	Mode	[0058]=Mode 58
	54	64	74	84	Heat sink temperature of compressor IPDU1	×1	˚C	[0024]=24 ˚C
	55	65	75	85	Heat sink temperature of compressor IPDU2	×1	˚C	
	56	66	76	–	Heat sink temperature of compressor IPDU3	×1	˚C	
	57	67	77	87	Heat sink temperature of outdoor fan IPDU	×1	˚C	
	58	–	–	–	In heat/cool collecting control *5	0: Normal 1: In collecting control		[0010] = In heat collecting control [0001] = In cool collecting control
	59	–	–	–	Pressure release *5	0: Normal 1: In release control		[0010] = In pressure release control
	5A	–	–	–	Discharge temperature release *5			[0001] = In discharge temperature release control
	5B	–	–	–	Terminal unit release (U2 / U3 / U4 outdoor unit) *5			[0100] = In U2 outdoor unit release control [0010] = In U3 outdoor unit release control [0001] = In U4 outdoor unit release control
	5F	6F	7F	8F	Horse power of outdoor unit	×1	HP	[0016]=16HP

*1 The TF/TSA/TOA sensors are equipped only with some types of indoor units. The data does not appear for other types.

*2 In the case of group connection, only the header indoor unit data can be displayed.

*3 The upper digit of CODE No. indicates the outdoor unit No.

*4 [(The upper digit of CODE No.) − 4] indicates the outdoor unit No.
1∗, 5∗... U1 outdoor unit (Header unit)
2∗, 6∗ ... U2 outdoor unit (follower unit 1)
3∗, 7∗ ... U3 outdoor unit (follower unit 2)
4∗, 8∗ ... U4 outdoor unit (follower unit 3)

*5 Only CODE No. 5∗ of U1 outdoor unit (Header unit) is displayed.

◆ LED display of circuit board

1.D02 (Red)

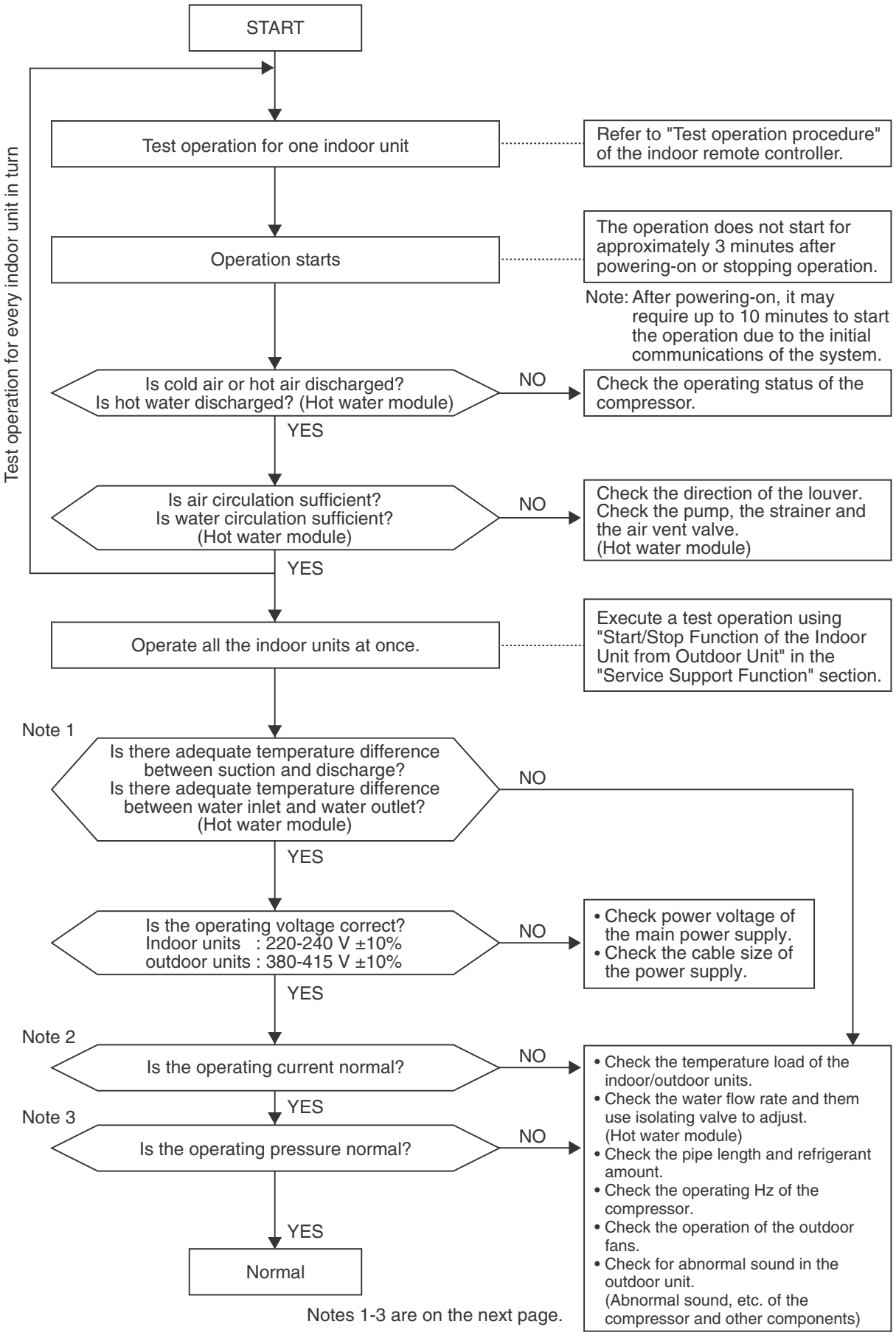
- Lights up when the power is turned on (Microcomputer works)
- Blinks at 1-second intervals (0.5-second): No EEPROM, or writing error
- Blinks at 10-second intervals (5-second): No DISP mode
- Blinks at 2-second intervals (1-second): Function change being set (EEPROM)

2.D203 (Red): Remote controller communication

- The group header unit lights up for the first half 5 seconds while communicating with the remote controller
- Blinks for the second half 5 seconds at 0.2-second intervals (0.1-second) during communication between group indoor header and follower

7-6. Test operation check

Test operation


START
Test operation for one indoor unit
Refer to "Test operation procedure" of the indoor remote controller.
Operation starts
The operation does not start for approximately 3 minutes after powering-on or stopping operation.
Note: After powering-on, it may require up to 10 minutes to start the operation due to the initial communications of the system.
Is cold air or hot air discharged?
Is hot water discharged? (Hot water module)
NO
Check the operating status of the compressor.
YES
Is air circulation sufficient?
Is water circulation sufficient?
(Hot water module)
NO
Check the direction of the louver.
Check the pump, the strainer and the air vent valve.
(Hot water module)
YES
Test operation for every indoor unit in turn
Operate all the indoor units at once.
Execute a test operation using "Start/Stop Function of the Indoor Unit from Outdoor Unit" in the "Service Support Function" section.
Note 1
Is there adequate temperature difference between suction and discharge?
Is there adequate temperature difference between water inlet and water outlet?
(Hot water module)
NO
YES
Is the operating voltage correct?
Indoor units : 220-240 V ±10%
outdoor units : 380-415 V ±10%
NO
• Check power voltage of the main power supply.
• Check the cable size of the power supply.
YES
Note 2
Is the operating current normal?
NO
• Check the temperature load of the indoor/outdoor units.
• Check the water flow rate and them use isolating valve to adjust. (Hot water module)
• Check the pipe length and refrigerant amount.
• Check the operating Hz of the compressor.
• Check the operation of the outdoor fans.
• Check for abnormal sound in the outdoor unit. (Abnormal sound, etc. of the compressor and other components)
YES
Note 3
Is the operating pressure normal?
NO
YES
Normal

Notes 1-3 are on the next page.

Note 1: Criteria for the difference between suction and discharge temperatures, between water inlet and water outlet temperature

(1) Cooling operation
After operating for a minimum of 30 minutes in “COOL” mode, if the ΔT dry bulb temperature difference between suction and discharge air of the indoor unit is 8°C or more, it is normal.

(2) Heating operation
After operating for a minimum of 30 minutes in “HEAT” mode, if the ΔT dry bulb temperature difference between suction and discharge air of the indoor unit is 15°C or more, it is normal.
After operating for a minimum of 30 minutes in “HEAT” mode, if the ΔT water temperature difference between water inlet and water outlet of the hot water module is 3 to 5 degrees, it is normal. (Hot water module)

* If demand from the indoor unit on the outdoor unit is low because the difference between the temperature set by the remote controller and the temperature of the room or the difference between the temperature set by the remote controller and the water inlet temperature is small, then the ΔT temperature difference is small.
* Consider that ΔT temperature difference may diminish in cases of a system in which the connected indoor unit capacity exceeds the outdoor unit capacity, the pipe length is long, or a large difference exists among outdoor units.

Note 2: Criteria for operating power current

The table below shows the maximum current for each outdoor unit. Under standard conditions, operating current is about 80% of the value shown in the table below.

Outdoor unit	MMY-MAP	0804∗	1004∗	1204∗	1404∗	1604∗
Current value	(A)	23.5	25.5	28.5	33.2	36.5

Note 3: Criteria for cycle status

(1) These data are based on operating a 4-way Air Discharge Cassette type air conditioner of 100% connection with standard piping length.
Data may vary depending on temperature conditions, installed pipe length, and room shape combinations, or indoor unit connection capacity.
For pressure criteria in different temperature conditions, refer to (2).

Outdoor unit MMY-MAP	Operating mode	Pressure (MPa)		Pipe surface temperature (˚C)					Number of compressor rotations (rps)*			Indoor fan	Air temperature condition (DB/WB) (˚C)	
		Pd	Ps	Discharge (TD)	Suction (TS)	Indoor heat exchanger (TC)	Outdoor heat exchanger (TE)	Liquid temperature (TL)	Compressor 1	Compressor 1	Compressor 1		Indoor	Outdoor
0804∗	Cooling	2.9	0.9	85	15	10	40	40	50	50	—	High	27/19	35/-
	Heating	3.0	0.7	85	5	35	3	30	50	50	—	High	20/-	7/6
1004∗	Cooling	3.0	0.8	85	15	8	40	40	65	65	—	High	27/19	35/-
	Heating	3.1	0.7	85	4	35	2	30	65	65	—	High	20/-	7/6
1204∗	Cooling	3.1	0.8	85	17	8	40	40	70	70	—	High	27/19	35/-
	Heating	3.1	0.7	90	2	35	2	30	75	75	—	High	20/-	7/6
1404∗	Cooling	3.0	0.8	85	15	10	40	40	60	60	60	High	27/19	35/-
	Heating	3.1	0.7	85	4	35	3	30	60	60	60	High	20/-	7/6
1604∗	Cooling	3.1	0.8	90	15	10	40	40	65	65	65	High	27/19	35/-
	Heating	3.1	0.7	90	2	35	2	30	65	65	65	High	20/-	7/6

* This compressor is driven with a 4-pole motor. The value of the compressor frequency (rps) measured with a clamp meter at the compressor lead line is two times the rotation count (rps) of the compressor.
* Each compressor may have a different frequency as a measure against resonance.
* The temperature of the indoor heat exchanger (TC) indicates TCJ sensor temperature when cooling, and TC2 sensor temperature when heating, respectively.

(2) Criteria for operating pressure

Operating mode		Cooling	Heating
Indoor temperature (˚C)		18~32	15~32
Outdoor temperature (˚C)		25~35	5~35
Pressure	High pressure (MPa)	2.0~3.3	2.5~3.3
	Low pressure (MPa)	0.5~0.9	0.5~0.7

* Criteria after 15 minutes or more has passed since operating started

(3) On rotations of outdoor fans
Outdoor fans may rotate slowly to control pressure when cooling with low outer air temperature or heating with excessive load. For control content, also refer to items in Section 5, “Control Outline: Outdoor Unit, Outdoor Fan Control.”

8. TROUBLESHOOTING

8-1. Overview

(1) Before engaging in troubleshooting

(a) Applicable models
Super Module Multi (SMMS-i) models.
(Indoor units: MMW-APOOO, Outdoor units: MMY-MAPOOOO*)

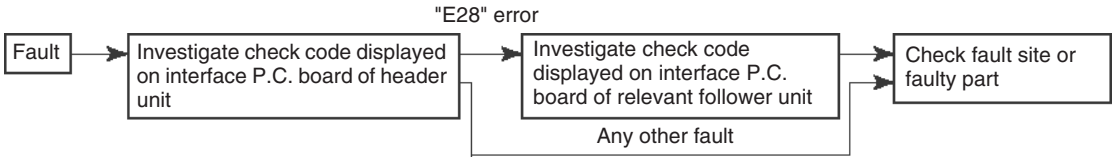
(b) Tools and measuring devices required

- Screwdrivers (Philips, flat head), spanners, long-nose pliers, nipper, pin to push reset switch, etc.
- Multimeter, thermometer, pressure gauge, etc.

(c) Things to check prior to troubleshooting (behaviors listed below are normal)

NO.	Behavior	Possible cause
1	A compressor would not start	• Could it just be the 3-minute delay period (3 minutes after compressor shutdown)? • Could it just be the hot water module having gone thermo OFF ? • Could it just be the hot water module put on the timer ? • Could it just be the system going through initial communication ?
2	A pump would not start	• Could it just be the outdoor unit under cooling operation ? As the priority is usually given to operation of the indoor unit connected to the same outdoor unit, the hot water module is in the waiting status usually while the indoor unit works in cooling mode. • Could it just be out of the water temperature using range ? Hot water module is not possible to operat when water temperatue above 60˚C
3	An outdoor fan would not start or would change speed for no reason	• Could it just be defrosting operation ?
4	A pump would not stop	• Could it just be defrosting or under oil (refrigerant) recovery control ?
5	The air conditioner would not respond to a start / stop command from a remote controller	• Could it just be the hot water module operation under external controller ?
6	The water temperature dose not increase	• Could it just be the water flow rate is out of using range ? Using renge of hot water module is rated ±15%

(2) Troubleshooting procedure
When a fault occurs, proceed with troubleshooting in accordance with the procedure shown below.


"E28" error
Fault
Investigate check code displayed on interface P.C. board of header unit
Investigate check code displayed on interface P.C. board of relevant follower unit
Check fault site or faulty part
Any other fault

NOTE

Rather than a genuine fault (see the List of Check Codes below), the problem could have been caused by a microprocessor malfunction attributable to a poor quality of the power source or an external noise. Check for possible noise sources, and shield the remote controller wiring and signal wires as necessary.

8-2. Troubleshooting method

The remote controllers (main remote controller and central control remote controller) and the interface P.C. board of an outdoor unit are provided with an LCD display (remote controller) or a 7-segment display (outdoor interface P.C. board) to display operational status. Using this self-diagnosis feature, the fault site / faulty part may be identified in the event of a fault by following the method described below.

The list below summarizes check codes detected by various devices. Analyze the check code according to where it is displayed and work out the nature of the fault in consultation with the list.

- When investigating a fault on the basis of a display provided on the indoor remote controller or TCC-LINK central control remote controller -
  See the “TCC-LINK remote controller or main remote controller display” section of the list.
- When investigating a fault on the basis of a display provided on an outdoor unit - See the “Outdoor 7-segment display” section of the list.
- When investigating a fault on the basis of a wireless remote controller-controlled indoor unit - See the “Light sensor indicator light block” section of the list.

List of check codes (indoor unit)

(Error detected by indoor unit)

IPDU: Intelligent Power Drive Unit (Inverter P.C. board)
Indoor unit (including Hot Water Module)

Check code			Typical fault site	Description of error
TCC-LINK central control or main remote controller display	Outdoor 7-segment display			
		Sub-code		
A01	A01	Detected indoor nuit No.	Flow switch operation error	When water flow rate is reduced.
A02	A02	Detected indoor nuit No.	Water temperature decrease error	Water temperature continued the low status regardless of that the heater pump is operating.
A04	A04	Detected indoor nuit No.	Activation of water heat exchanger frost protection	Frost protection for water heat exchanger is activated
E03	—	—	Indoor-remote controller periodic communication error	Communication from remote controller or network adaptor has been lost (so has central control communication).
E04	—	—	Indoor-outdoor periodic communication error	Signals are not being received from outdoor unit.
E08	E08	Duplicated indoor address	Duplicated indoor address	Indoor unit detects address identical to its own.
E10	—	—	Indoor inter-MCU communication error	MCU communication between main controller and motor microcontroller is faulty.
E18	—	—	Error in periodic communication between indoor header and follower unit	Periodic communication between indoor header and follower units cannot be maintained.
F01	—	—	Indoor heat exchanger temperature sensor (TCJ) error	Heat exchanger temperature sensor (TCJ) has been open / shortcircuited.
F03	—	—	Indoor heat exchanger temperature sensor (TC1) error	Heat exchanger temperature sensor (TC1) has been open / shortcircuited.
F19	—	—	Indoor heat exchanger temperature sensor (TF) error	Heat exchanger temperature sensor (TF) has been open / shortcircuited.
F25	—	—	Indoor heat exchanger temperature sensor (TA) error	Heat exchanger temperature sensor (TA) has been open / shortcircuited.
F26	—	—	Indoor heat exchanger temperature sensor (TC2) error	Heat exchanger temperature sensor (TC2) has been open / shortcircuited.
F29	—	—	P.C. board or other indoor error	Indoor EEPROM is abnormal (some other error may be detected).
L03	—	—	Duplicated indoor group header unit	There is more than one header unit in group.
L07	—	—	Connection of group control cable to stand-alone indoor unit	There is at least one stand-alone indoor unit to which group control cable is connected.
L08	L08	—	Indoor group address not set	Address setting has not been performed for one or more indoor units (also detected at outdoor unit end).
L09	—	—	Indoor capacity not set	Capacity setting has not been performed for indoor unit.
L20	—	—	Duplicated central control address	There is duplication in central control address setting.
L30	L30	Detected indoor unit No.	Indoor external error input (interlock)	Unit shutdown has been caused by external error input (CN80).
P31	—	—	Other indoor unit error	Follower unit cannot be operated due to header unit alarm (E03 / L03 / L07 / L08).

(Error detected by main remote controller) Indoor unit (including Hot Water Module)

Check code			Typical fault site	Description of error
Main remote controller	Outdoor 7-segment display			
		Sub-code		
E01	—	—	No master remote controller, faulty remote controller communication (reception)	Signals cannot be received from indoor unit; master remote controller has not been set (including two remote controller control).
E02	—	—	Faulty remote controller communication (transmission)	Signals cannot be transmitted to indoor unit.
E02	—	—	Duplicated master remote controller	Both remote controllers have been set as master remote controller in two remote controller control (alarm and shutdown for header unit and continued operation for follower unit)

(Error detected by central control device)

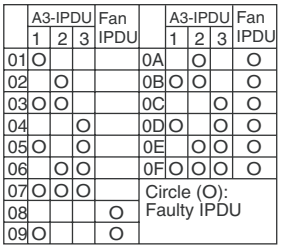
Check code			Typical fault site	Description of error
TCC-LINK central control	Outdoor 7-segment display			
		Sub-code		
C06	—	—	Faulty central control communication (reception)	Central control device is unable to receive signal.
C12	—	—	Blanket alarm for generalpurpose device control interface	Device connected to general-purpose device control interface for TCC-LINK is faulty.
P30	—	—	Group control follower unit error	Group follower unit is faulty (unit No. and above detail [∗∗∗] displayed on main remote controller)

Note: The same error, e.g. a communication error, may result in the display of different check codes depending on the device that detects it.
Moreover, check codes detected by the main remote controller / central control device do not necessarily have a direct impact on air conditioner operation.

List of check codes (outdoor unit)

(Errors detected by SMMS outdoor interface - typical examples)

IPDU: Intelligent Power Drive Unit (Inverter P.C. board)
Indoor unit (including Hot Water Module)

Check code			Typical fault site	Description of error
Outdoor 7-segment display		TCC-LINK central control or main remote controller display		
	Sub-code			
E06	Number of indoor units from which signal is received normally	E06	Dropping out of indoor unit	Indoor unit initially communicating normally fails to return signal (reduction in number of indoor units connected).
E07	—	(E04)	Indoor-outdoor communication circuit error	Signal cannot be transmitted to indoor units (indoor units left without communication from outdoor unit).
E08	Duplicated indoor address	(E08)	Duplicated indoor address	More than one indoor unit is assigned same address (also detected at indoor unit end).
E12	01: Indoor-outdoor communication 02: Outdoor-outdoor communication	E12	Automatic address starting error	Indoor automatic address setting is started while automatic address setting for equipment in other refrigerant line is in progress. Outdoor automatic address setting is started while automatic address setting for indoor units is in progress.
E15	—	E15	Indoor unit not found during automatic address setting	Indoor unit fails to communicate while automatic address setting for indoor units is in progress.
E16	00: Overloading 01: Number of units connected	E16	Too many indoor units connected / overloading	Combined capacity of indoor units is too large (more than 135 % of combined capacity of outdoor units). ∗
E19	00: No header unit 02: Two or more header units	E19	Error in number of outdoor header units	There is no or more than one outdoor header unit in one refrigerant line.
E20	01: Connection of outdoor unit from other refrigerant line 02: Connection of indoor unit from other refrigerant line	E20	Connection to other refrigerant line found during automatic address setting	Indoor unit from other refrigerant line is detected while indoor automatic address setting is in progress.
E23	—	E23	Outdoor-outdoor communication transmission error	Signal cannot be transmitted to other outdoor units.
E25	—	E25	Duplicated follower outdoor address	There is duplication in outdoor addresses set manually.
E26	Address of outdoor unit from which signal is not received normally	E26	Dropping out of outdoor unit	Follower outdoor unit initially communicating normally fails to do so (reduction in number of follower outdoor units connected).
E28	Detected outdoor unit No.	E28	Outdoor follower unit error	Outdoor header unit detects fault relating to follower outdoor unit (detail displayed on follower outdoor unit).
E31		E31	IPDU communication error	There is no communication between IPDUs (P. C. boards) in inverter box.
F04	—	F04	Outdoor discharge temperature sensor (TD1) error	Outdoor discharge temperature sensor (TD1) has been open / short-circuited.
F05	—	F05	Outdoor discharge temperature sensor (TD2) error	Outdoor discharge temperature sensor (TD2) has been open / short-circuited.
F06	01: TE1 02: TE2	F06	Outdoor heat exchanger temperature sensor (TE1, TE2) error	Outdoor heat exchanger temperature sensors (TE1, TE2) have been open / short-circuited.
F07	—	F07	Outdoor liquid temperature sensor (TL) error	Outdoor liquid temperature sensor (TL) has been open / short-circuited.
F08	—	F08	Outdoor outside air temperature sensor (TO) error	Outdoor outside air temperature sensor (TO) has been open / short-circuited.
F11	—	F11		
F12	—	F12	Outdoor suction temperature sensor (TS1) error	Outdoor suction temperature sensor (TS1) has been open / short-circuited.
F13	01: Compressor 1 02: Compressor 2 03: Compressor 3	F13	Outdoor IGBT built-in temperature sensor (TH) error	Open-circuit or short-circuit of the outdoor IGBT built-in temperature sensor (TH) was detected.
F15	—	F15	Outdoor temperature sensor (TE1, TL) wiring error	Wiring error in outdoor temperature sensors (TE1, TL) has been detected.
F16	—	F16	Outdoor pressure sensor (Pd, Ps) wiring error	Wiring error in outdoor pressure sensors (Pd, Ps) has been detected.
F19	—	F19	Indoor TF(TCJ2) sensor error	• Check connection of TF sensor connector. • Check resistance characteristics of TF sensor.
F22	—	F22	Outdoor discharge temperature sensor (TD3) error	Outdoor discharge temperature sensor (TD3) has been open / short-circuited.
F23	—	F23	Low pressure sensor (Ps) error	Output voltage of low pressure sensor (Ps) is zero.

∗ When the indoor unit connection capacity is calculated, AP005 is calculated as 0.8 HP.

Check code			Typical fault site	Description of error
Outdoor 7-segment display		TCC-LINK central control or main remote controller display		
	Sub-code			
F24	—	F24	High pressure sensor (Pd) error	Output voltage of high pressure sensor (Pd) is zero or provides abnormal readings when compressors have been turned off.
F25	—	F25	Indoor TA(TWI) sensor error	• Check connection of TA sensor connector. • Check resistance characteristics of TA sensor.
F26	—	F26	Indoor TC2(TWO) sensor error	• Check connection of TC2 sensor connector. • Check resistance characteristics of TC2 sensor.
F31	—	F31	Outdoor EEPROM error	Outdoor EEPROM is faulty (alarm and shutdown for header unit and continued operation for follower unit)
H01	01: Compressor 1 02: Compressor 2 03: Compressor 3	H01	Compressor breakdown	Overcurrent of the inverter current (Idc) detection circuit was detected.
H02	01: Compressor 1 02: Compressor 2 03: Compressor 3	H02	Compressor error (Lock)	Compressor lock was detected.
H03	01: Compressor 1 02: Compressor 2 03: Compressor 3	H03	Current detection circuit error	Current error was detected while the compressor was stopped.
H05	—	H04	Compressor 1 case thermo activation	Compressor 1 case thermo was activated for protection.
H05	—	H05	Outdoor discharge temperature sensor (TD1) wiring error	Wiring / installation error or detachment of outdoor discharge temperature sensor (TD1) has been detected.
H06	—	H06	Activation of low-pressure protection	Low pressure (Ps) sensor detects abnormally low operating pressure.
H07	—	H07	Activation of low-pressure protection	Temperature sensor for oil level detection (TK1-5) detects abnormally low oil level.
H08	01: TK1 sensor error 02: TK2 sensor error 03: TK3 sensor error 04: TK4 sensor error 05: TK5 sensor error	H08	Error in temperature sensor for oil level detection (TK1-5)	Temperature sensor for oil level detection (TK1-5) has been open / short-circuited.
H14	—	H14	Compressor 2 case thermo activation	Compressor 2 case thermo was activated for protection.
H15	—	H15	Outdoor discharge temperature sensor (TD2) wiring error	Wiring / installation error or detachment of outdoor discharge temperature sensor (TD2) has been detected.
H16	01: TK1 oil circuit error 02: TK2 oil circuit error 03: TK3 oil circuit error 04: TK4 oil circuit error 05: TK5 oil circuit error	H16	Oil level detection circuit error	No temperature change is detected by temperature sensor for oil level detection (TK1-5) despite compressor having been started.
H25	—	H25	Outdoor discharge temperature sensor (TD3) wiring error	Wiring / installation error or detachment of outdoor discharge temperature sensor (TD3) has been detected.
L02	—	L02	Outdoor unit combination error	Check the soft ware version on the I/F PC board of the outdoor unit.
L04	—	L04	Duplicated outdoor refrigerant line address	Identical refrigerant line address has been assigned to outdoor units belonging to different refrigerant piping systems.
L06	Number of priority indoor units (check code L05 or L06 depending on individual unit)	L06	Duplicated priority indoor unit (as displayed on priority indoor unit)	More than one indoor unit has been set up as priority indoor unit.
			Duplicated priority indoor unit (as displayed on indoor unit other than priority indoor unit)	More than one indoor unit has been set up as priority indoor unit.
L08	—	(L08)	SIM Indoor group address not set	Address setting has not been performed for one or more indoor units (also detected at indoor end).
L10	—	L10	Outdoor capacity not set	Outdoor unit capacity has not been set (after P.C. board replacement).
L17	—	L17	Outdoor model incompatibility error	Old model outdoor unit (prior to 3 series) has been connected.
L18	—	L18	FS (Flow Selector) unit error	Cooling / heating cycle error resulting from piping error is detected.
L28	—	L28	Too many outdoor units connected	More than four outdoor units have been connected.
L29	SMMS-i (Series 4) A3-IPDU 1 2 3, Fan IPDU 01 O 02 O 03 O O 04 O 05 O O 06 O O 07 O O O 08 O 09 O O 0A O 0B O O 0C O O 0D O O 0E O O O 0F O O O O Circle (O): Faulty IPDU	L29	Error in number of IPDUs	There are insufficient number of IPDUs (P.C. boards) in inverter box.

Check code		TCC-LINK central control or main remote controller display	Typical fault site	Description of error
Outdoor 7-segment display				
	Sub-code			
L30	Detected indoor unit No.	(L30)	Indoor external error input (interlock)	Indoor unit has been shut down for external error input in one refrigerant line (detected by indoor unit).
P03	—		Outdoor discharge (TD1) temperature error	Outdoor discharge temperature sensor (TD1) has detected abnormally high temperature.
P04	P0301: Compressor 1 02: Compressor 2 03: Compressor 3	P04	High-pressure SW activation	High-pressure SW was activated.
P05	00: Open phase detected	P05	Open phase / power failure	Open phase is detected when power is turned on. Inverter DC voltage is too high (overvoltage) or too low (undervoltage).
	01: Compressor 1 ALT 02: Compressor 2 03: Compressor 3		Inverter DC voltage (Vdc) error MG-CTT error	
P07	01: Compressor 1 02: Compressor 2 03: Compressor 3	P07	Heat sink overheating error	Temperature sensor built into IGBT (TH) detects overheating.
P10	Indoor unit No. detected	(P10)	Indoor unit overflow	Indoor unit has been shutdown in one refrigerant line due to detection of overflow (detected by indoor unit).
P13	—	P13	Outdoor liquid backflow detection error	State of refrigerant cycle circuit indicates liquid backflow operation.
P15	01: TS condition 02: TD condition	P15	Gas leak detection	Outdoor suction temperature sensor (TS1) detects sustained and repeated high temperatures that exceed standard value.
P17	—	P17	Outdoor discharge (TD2) temperature error	Outdoor discharge temperature sensor (TD2) detects abnormally high temperature.
P18	—	P18	Outdoor discharge (TD3) temperature error	Outdoor discharge temperature sensor (TD3) detects abnormally high temperature.
P19	Outdoor unit No. detected	P19	4-way valve reversing error	Abnormality in refrigerating cycle is detected during heating operation.
P20	—	P20	Activation of high-pressure protection	High pressure (Pd) sensor detects high pressure that exceeds standard value.
F13	01: Compressor 1 02: Compressor 2 03: Compressor 3	F13	Error in temperature sensor built into indoor IGBT (TH)	Temperature sensor built into indoor IGBT (TH) has been open / short-circuited.
H01	01: Compressor 1 02: Compressor 2 03: Compressor 3	H01	Compressor breakdown	Inverter current (Idc) detection circuit detects overcurrent.
H02	01: Compressor 1 02: Compressor 2 03: Compressor 3	H02	Compressor error (lockup)	Compressor lockup is detected
H03	01: Compressor 1 02: Compressor 2 03: Compressor 3	H03	Current detection circuit error	Abnormal current is detected while inverter compressor is turned off.
P04	01: Compressor 1 02: Compressor 2 03: Compressor 3	P04	Activation of high-pressure SW	High-pressure SW is activated.
P07	—	P07	Heat sink overheating error	Temperature sensor built into IGBT (TH) detects overheating.
P20	—	P20	High-pressure protection activation	High-pressure (Pd) sensor detected a value over the criteria.
P22	SMMS-i (Series 4) 0..: IGBT circuit 1..: Position detection circuit error 3..: Motor lockup error 4..: Motor current detection C..: TH sensor error D..: TH sensor error E..: Inverter DC voltage error (outdoor fan) Note: Although letters 0 to F appear at locations indicated by "∗", please ignore them.	P22	Outdoor fan IPDU error	Outdoor fan IPDU detects error.
P26	01: Compressor 1 02: Compressor 2 03: Compressor 3	P26	Activation of G-Tr (IGBT) short-circuit protection	Short-circuit protection for compressor motor driver circuit components is activated (momentary overcurrent).
P29	01: Compressor 1 02: Compressor 2 03: Compressor 3	P29	Compressor position detection circuit error	Compressor motor position detection error is detected.
A01	—	A01	Flow switch protective operation	• Check the pump. • Check the strainer. • Check the flow switch. (Type, directtion of attachment and point of contact)

MG-CTT: Magnet contactor

Check code		TCC-LINK central control or main remote controller display	Typical fault site	Description of error
Outdoor 7-segment display				
	Sub-code			
A02	—	A02	Water temperature decrease error	• Check the water temperature. • Check the heat insulator of wate pipes.
A04	—	A04	Plate type heatexchanger freezing protective operation	• Check the line heater. • Check the PMV coil and PMV. • Check the 2way valve coil and 2way valve.

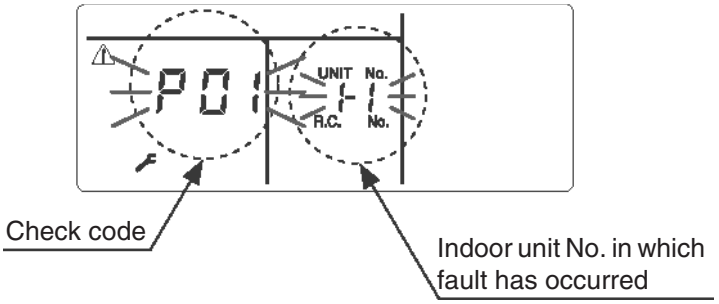
Note: The above check codes are examples only, and different check codes may be displayed depending on the outdoor unit configuration (e.g. a Super heat recovery multi system).
For details, see the service manual for the outdoor unit.

8-3. Troubleshooting based on information displayed on remote controller

Using main remote controller (RBC-AMT32E)

(1) Checking and testing

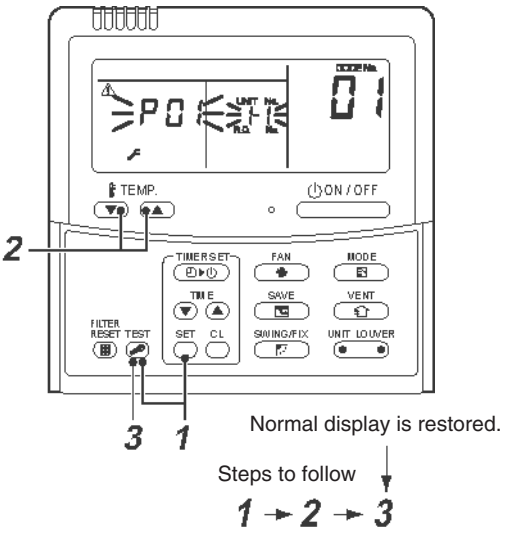
When a fault occurs to an air conditioner, a check code and indoor unit No. are displayed on the display window of the remote controller.
Check codes are only displayed while the air conditioner is in operation.
If the display has already disappeared, access error history by following the procedure described below.



(2) Error history

The error history access procedure is described below (up to four errors stored in memory).
Error history can be accessed regardless of whether the air conditioner is in operation or shut down.

<Procedure> To be performed when system at rest



1 **Invoke the SERVICE CHECK mode by pressing the TEST + SET buttons simultaneously and holding for at least 4 seconds.**

The letters " SERVICE CHECK" light up, and the check code "01" is displayed, indicating the error history. This is accompanied by the indoor unit No. to which the error history is related and a check code.

2 **To check other error history items, press the TEMP. button to select another check code.**

Check code "01" (latest) → Check code "04" (oldest)
Note: Error history contains four items.

3 **When the TEST button is pushed, normal display is restored.**

NOTE

Do not push the CL button as it would erase the whole error history of the indoor unit.

How to read displayed information

<7-segment display symbols>

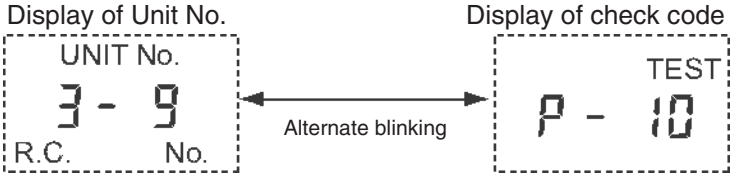
<Corresponding alphanumerical letters>

0 1 2 3 4 5 6 7 8 9 A b C d E F H J L P

Using TCC-LINK central control remote controller (TCB-SC642TLE2)

(1) Checking and testing

When a fault occurs to an air conditioner, a check code and indoor unit No. are displayed on the display window of the remote controller. Check codes are only displayed while the air conditioner is in operation.
If the display has already disappeared, access error history by following the procedure described below.



(2) Error history

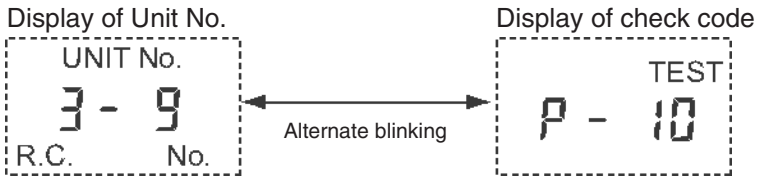
The error history access procedure is described below (up up four errors stored in memory).
Error history can be accessed regardless of whether the air conditioner is in operation or shut down.

1 Push the TEST + SET buttons simultaneously and hold for at least 4 seconds.

2 The letters " SERVICE CHECK" light up, and the check code "01" is displayed.

3 When a group No. is selected (blinking), if there is an error history, the UNIT No. and the latest error history information are displayed alternately.

*During this procedure, the temperature setting feature is unavailable.



4 To check other error history items, push the TEMP. button to select another check code (01-04).

5 To check check code relating to another group, push (ZONE) and (GROUP) ◁ ▷ buttons to select a group No.
Do not push the CL button as it would erase the whole error history of the selected group.

6 To finish off the service check, push the TEST button.

8-4. Check codes displayed on remote controller and SMMS outdoor unit (7-segment display on I/F board) and locations to be checked

IPDU: Intelligent Power Drive Unit (Inverter P.C. board)
Indoor unit (including Hot Water Module)

For other types of outdoor units, refer to their own service manuals.

Check code			Location of detection	Description	System status	Error detection condition(s)	Check items (locations)
Main remote controller	Outdoor 7-segment display						
	Check code	Sub-code					
E01	—	—	Remote controller	Indoor-remote controller communication error (detected at remote controller end)	Stop of corresponding unit	Communication between indoor P.C. board and remote controller is disrupted.	• Check remote controller inter-unit tie cable (A / B). • Check for broken wire or connector bad contact. • Check indoor power supply. • Check for defect in indoor P.C. board. • Check remote controller address settings (when two remote controllers are in use). • Check remote controller P.C. board.
E02	—	—	Remote controller	Remote controller transmission error	Stop of corresponding unit	Signal cannot be transmitted from remote controller to indoor unit.	• Check internal transmission circuit of remote controller. --- Replace remote controller as necessary.
E03	—	—	Indoor unit	Indoor-remote controller communication error (detected at indoor end)	Stop of corresponding unit	There is no communication from remote controller (including wireless) or network adaptor.	• Check remote controller and network adaptor wiring.
E04	—	—	Indoor unit	Indoor-outdoor communication circuit error (detected at indoor end)	Stop of corresponding unit	Indoor unit is not receiving signal from outdoor unit.	• Check order in which power was turned on for indoor and outdoor units. • Check indoor address setting. • Check indoor-outdoor tie cable. • Check outdoor termination resistance setting (SW30, Bit 2).
E06	E06	No. of indoor units from which signal is received normally	I/F	Dropping out of indoor unit	All stop	Indoor unit initially communicating normally fails to return signal for specified length of time.	• Check power supply to indoor unit. (Is power turned on?) • Check connection of indoor-outdoor communication cable. • Check connection of communication connectors on indoor P.C. board. • Check connection of communication connectors on outdoor P.C. board. • Check for defect in indoor P.C. board. • Check for defect in outdoor P.C. board (I/F).
—	E07	—	I/F	Indoor-outdoor communication circuit error (detected at outdoor end)	All stop	Signal cannot be transmitted from outdoor to indoor units for 30 seconds continuously.	• Check outdoor termination resistance setting (SW30, Bit 2). • Check connection of indoor-outdoor communication circuit.
E08	E08	Duplicated indoor address	Indoor unit I/F	Duplicated indoor address	All stop	More than one indoor unit is assigned same address.	• Check indoor addresses. • Check for any change made to remote controller connection (group / individual) since indoor address setting.
E09	—	—	Remote controller	Duplicated master remote controller	Stop of corresponding unit	In two remote controller configuration (including wireless), both controllers are set up as master. (Header indoor unit is shut down with alarm, while follower indoor units continue operating.)	• Check remote controller settings. • Check remote controller P.C. boards.
E10	—	—	Indoor unit	Indoor inter-MCU communication error	Stop of corresponding unit	Communication cannot be established / maintained upon turning on of power or during communication.	• Check for defect in indoor P.C. board

Check code			Location of detection	Description	System status	Error detection condition(s)	Check items (locations)
Main remote controller	Outdoor 7-segment display						
	Check code	Sub-code					
E12	E12	01: Indoor-outdoor communication 02: Outdooroutdoor communication	I/F	Automatic address starting error	All stop	• Indoor automatic address setting is started while automatic address setting for equipment in other refrigerant line is in progress. • Outdoor automatic address setting is started while automatic address setting for indoor units is in progress.	• Perform automatic address setting again after disconnecting communication cable to that refrigerant line.
E15	E15	—	I/F	Indoor unit not found during automatic address setting	All stop	Indoor unit cannot be detected after indoor automatic address setting is started.	• Check connection of indoor-outdoor communication line. • Check for error in indoor power supply system. • Check for noise from other devices. • Check for power failure. • Check for defect in indoor P.C. board.
E16	E16	00: Overloading 01-: No. of units connected	I/F	Too many indoor units connected	All stop	• Combined capacity of indoor units exceeds 135% of combined capacity of outdoor units. ∗ **Note:** **If this code comes up after backup setting for outdoor unit failure is performed, perform "No overloading detected" setting.** <"No overloading detected" setting method> Turn on SW09/Bit 2 on I/F P.C. board of outdoor header unit. • More than 48 indoor units are connected.	• Check capacities of indoor units connected. • Check combined HP capacities of indoor units. • Check HP capacity settings of outdoor units. • Check No. of indoor units connected. • Check for defect in outdoor P.C. board (I/F).
E18	—	—	Indoor unit	Error in communication between indoor header and follower units	Stop of corresponding unit	Periodic communication between indoor header and follower units cannot be maintained.	• Check remote controller wiring. • Check indoor power supply wiring. • Check P.C. boards of indoor units.
E19	E19	00: No header unit 02: Two or more header units	I/F	Error in number of outdoor header units	All stop	• There is more than one outdoor header unit in one line. • There is no outdoor header unit in one line.	Outdoor header unit is outdoor unit to which indoor-outdoor tie cable (U1,U2) is connected. • Check connection of indoor-outdoor communication line. • Check for defect in outdoor P.C. board (I/F).
E20	E20	01: Connection of outdoor unit from other line 02: Connection of indoor unit from other line	I/F	Connection to other line found during automatic address setting	All stop	Equipment from other line is found to have been connected when indoor automatic address setting is in progress.	Disconnect inter-line tie cable in accordance with automatic address setting method explained in "Address setting" section.
E23	E23	—	I/F	Outdooroutdoor communication transmission error	All stop	Signal cannot be transmitted to other outdoor units for at least 30 seconds continuously.	• Check power supply to outdoor units. (Is power turned on?) • Check connection of tie cables between outdoor units for bad contact or broken wire. • Check communication connectors on outdoor P.C. boards. • Check for defect in outdoor P.C. board (I/F). • Check termination resistance setting for communication between outdoor units.

∗ When the indoor unit connection capacity is calculated, AP005 is calculated as 0.8 HP.

<table>
<tr><th colspan="3">Check code</th><th rowspan="2">Location of detection</th><th rowspan="2">Description</th><th rowspan="2">System status</th><th rowspan="2">Error detection condition(s)</th><th rowspan="2">Check items (locations)</th></tr>
<tr><th rowspan="2">Main remote controller</th><th colspan="2">Outdoor 7-segment display</th></tr>
<tr><th>Check code</th><th>Sub-code</th></tr>
<tr><td>E25</td><td>E25</td><td>—</td><td>I/F</td><td>Duplicated follower outdoor address</td><td>All stop</td><td>There is duplication in outdoor addresses set manually.</td><td>Note:
Do not set outdoor addresses manually.</td></tr>
<tr><td>E26</td><td>E26</td><td>Address of outdoor unit from which signal is not received normally</td><td>I/F</td><td>Dropping out of outdoor unit</td><td>All stop</td><td>Outdoor unit initially communicating normally fails to return signal for specified length of time.</td><td>• Backup setting is being used for outdoor units.
• Check power supply to outdoor unit. (Is power turned on?)
• Check connection of tie cables between outdoor units for bad contact or broken wire.
• Check communication connectors on outdoor P.C. boards.
• Check for defect in outdoor P.C. board (I/F).</td></tr>
<tr><td>E28</td><td>E28</td><td>Detected outdoor unit No.</td><td>I/F</td><td>Outdoor follower unit error</td><td>All stop</td><td>Outdoor header unit receives error code from outdoor follower unit.</td><td>• Check check code displayed on outdoor follower unit.
<Convenient functions>
If SW04 is pressed and held for at least 1 second while [E28] is displayed on the 7-segmentdisplay of outdoor header unit, the fan of the outdoor unit that has been shut down due to an error comes on.
If SW04 and SW05 are pressed simultaneously, the fans of normal outdoor units come on.
To stop the fan or fans, press SW05 on its own.</td></tr>
<tr><td>E31</td><td>E31</td><td>SMMS-i (Series 4)
<table><tr><th></th><th colspan="3">A3-IPDU</th><th>Fan</th></tr><tr><th></th><th>1</th><th>2</th><th>3</th><th>IPDU</th></tr><tr><td>01</td><td>O</td><td></td><td></td><td></td></tr><tr><td>02</td><td></td><td>O</td><td></td><td></td></tr><tr><td>03</td><td>O</td><td>O</td><td></td><td></td></tr><tr><td>04</td><td></td><td></td><td>O</td><td></td></tr><tr><td>05</td><td>O</td><td></td><td>O</td><td></td></tr><tr><td>06</td><td></td><td>O</td><td>O</td><td></td></tr><tr><td>07</td><td>O</td><td>O</td><td>O</td><td></td></tr><tr><td>08</td><td></td><td></td><td></td><td>O</td></tr><tr><td>09</td><td>O</td><td></td><td></td><td>O</td></tr><tr><td>0A</td><td></td><td>O</td><td></td><td>O</td></tr><tr><td>0B</td><td>O</td><td>O</td><td></td><td>O</td></tr><tr><td>0C</td><td></td><td></td><td>O</td><td>O</td></tr><tr><td>0D</td><td>O</td><td></td><td>O</td><td>O</td></tr><tr><td>0E</td><td></td><td>O</td><td>O</td><td>O</td></tr><tr><td>0F</td><td>O</td><td>O</td><td>O</td><td>O</td></tr></table>Symbol O signifies site of IPDU error.</td><td>I/F</td><td>IPDU communication error</td><td>All stop</td><td>Communication is disrupted between IPDUs (P.C. boards) in inverter box.</td><td>• Check wiring and connectors involved in communication between IPDU-I/F P.C. board for bad contact or broken wire.
• Check for defect in outdoor P.C. board (I/F, A3-IPDU or Fan IPDU).
• Check for external noise.</td></tr>
<tr><td>F01</td><td>—</td><td>—</td><td>Indoor unit</td><td>Indoor TCJ sensor error</td><td>Stop of corresponding unit</td><td>Sensor resistance is infinity or zero (open / short circuit).</td><td>• Check connection of TCJ sensor connector and wiring.
• Check resistance characteristics of TCJ sensor.
• Check for defect in indoor P.C. board.</td></tr>
<tr><td>F02</td><td>—</td><td>—</td><td>Indoor unit</td><td>Indoor TC2 sensor error</td><td>Stop of corresponding unit</td><td>Sensor resistance is infinity or zero (open / short circuit).</td><td>• Check connection of TC2 sensor connector and wiring.
• Check resistance characteristics of TC2 sensor.
• Check for defect in indoor P.C. board.</td></tr>
</table>

Check code			Location of detection	Description	System status	Error detection condition(s)	Check items (locations)
Main remote controller	Outdoor 7-segment display						
	Check code	Sub-code					
F03	—	—	Indoor unit	Indoor TC1 sensor error	Stop of corresponding unit	Sensor resistance is infinity or zero (open / short circuit).	• Check connection of TC1 sensor connector and wiring. • Check resistance characteristics of TC1 sensor. • Check for defect in indoor P.C. board.
F04	F04	—	I/F	TD1 sensor error	All stop	Sensor resistance is infinity or zero (open / short circuit).	• Check connection of TD1 sensor connector. • Check resistance characteristics of TD1 sensor. • Check for defect in outdoor P.C. board (I/F).
F05	F05	—	I/F	TD2 sensor error	All stop	Sensor resistance is infinity or zero (open / short circuit).	• Check connection of TD2 sensor connector. • Check resistance characteristics of TD2 sensor. • Check for defect in outdoor P.C. board (I/F).
F06	F06	01: TE1 sensor error 02: TE2 sensor error	I/F	TE1/TE2 sensor error	All stop	Sensor resistance is infinity or zero (open / short circuit).	• Check connection of TE1/ TE2 sensor connectors. • Check resistance characteristics of TE1/TE2 sensors. • Check for defect in outdoor P.C. board (I/F).
F07	F07	—	I/F	TL sensor error	All stop	Sensor resistance is infinity or zero (open / short circuit).	• Check connection of TL sensor connector. • Check resistance characteristics of TL sensor. • Check for defect in outdoor P.C. board (I/F).
F08	F08	—	I/F	TO sensor error	All stop	Sensor resistance is infinity or zero (open / short circuit).	• Check connection of TO sensor connector. • Check resistance characteristics of TO sensor. • Check for defect in outdoor P.C. board (I/F).
F10	—	—	Indoor unit	Indoor TA sensor error	Stop of corresponding unit	Sensor resistance is infinity or zero (open / short circuit).	• Check connection of TA sensor connector and wiring. • Check resistance characteristics of TA sensor. • Check for defect in indoor P.C. board.
F11	—	—	Indoor unit	Indoor TF sensor error	Stop of corresponding unit	Sensor resistance is infinity or zero (open / short circuit).	• Check connection of TF sensor connector and wiring. • Check resistance characteristics of TF sensor. • Check for defect in indoor P.C. board.
F12	F12	—	I/F	TS1 sensor error	All stop	Sensor resistance is infinity or zero (open / short circuit).	• Check connection of TS1 sensor connector. • Check resistance characteristics of TS1 sensor. • Check for defect in outdoor P.C. board (I/F).
F13	F13	01: Compressor 1 side 02: Compressor 2 side 03: Compressor 3 side	IPDU	TH sensor error	All stop	Sensor resistance is infinity or zero (open / short circuit).	• Defect in IGBT built-in temperature sensor → Replace A3-IPDU P.C. board.

Check code			Location of detection	Description	System status	Error detection condition(s)	Check items (locations)
Main remote controller	Outdoor 7-segment display						
	Check code	Sub-code					
F15	F15	—	I/F	Outdoor temperature sensor wiring error (TE1, TL)	All stop	During compressor operation in HEAT mode, TE1 continuously provides temperature reading higher than indicated by TL by at least specified margin for 3 minutes or more.	• Check installation of TE1 and TL sensors. • Check resistance characteristics of TE1 and TL sensors. • Check for outdoor P.C. board (I/F) error.
F16	F16	—	I/F	Outdoor pressure sensor wiring error (Pd, Ps)	All stop	Readings of high-pressure Pd sensor and lowpressure Ps sensor are switched. Output voltages of both sensors are zero.	• Check connection of highpressure Pd sensor connector. • Check connection of lowpressure Ps sensor connector. • Check for defect in pressure sensors Pd and Ps. • Check for error in outdoor P.C. board (I/F). • Check for deficiency in compressive output of compressor.
F22	F22	—	I/F	TD3 sensor error	All stop	Sensor resistance is infinity or zero. (open / short circuit)	• Check connection of TD3 sensor connector. • Check resistance characteristics of TD3 sensor. • Check for defect in outdoor P.C. board (I/F).
F23	F23	—	I/F	Ps sensor error	All stop	Output voltage of Ps sensor is zero.	• Check for connection error involving Ps sensor and Pd sensor connectors. • Check connection of Ps sensor connector. • Check for defect in Ps sensor. • Check for deficiency in compressive output of compressor. • Check for defect in 4-way valve. • Check for defect in outdoor P.C. board (I/F). • Check for defect in SV4 circuit.
F24	F24	—	I/F	Pd sensor error	All stop	Output voltage of Pd sensor is zero (sensor open-circuited). Pd > 4.15 MPa despite compressor having been turned off.	• Check connection of Pd sensor connector. • Check for defect in Pd sensor. • Check for defect in outdoor P.C. board (I/F).
F29	—	—	Indoor unit	Other indoor error	Stop of corresponding unit	Indoor P.C. board does not operate normally.	• Check for defect in indoor P.C. board (faulty EEPROM)
F31	F31	—	I/F	Outdoor EEPROM error	All stop *1	Outdoor P.C. board (I/F) does not operate normally.	• Check power supply voltage. • Check power supply noise. • Check for defect in outdoor P.C. board (I/F).
H01	H01	01: Compressor 1 side 02: Compressor 2 side 03: Compressor 3 side	IPDU	Compressor breakdown	All stop	Inverter current detection circuit detects overcurrent and shuts system down.	• Check power supply voltage. (AC200 V ± 10 %). • Check for defect in compressor. • Check for possible cause of abnormal overloading. • Check for defect in outdoor P.C. board (A3-IPDU).

*1 Total shutdown in case of header unit
Continued operation in case of follower unit

Check code			Location of detection	Description	System status	Error detection condition(s)	Check items (locations)
Main remote controller	Outdoor 7-segment display						
	Check code	Sub-code					
H02	H02	01: Compressor 1 side 02: Compressor 2 side 03: Compressor 3 side	IPDU	Compressor error (lockup) MG-CTT error	All stop	Overcurrent is detected several seconds after startup of inverter compressor.	• Check for defect in compressor. • Check power supply voltage. (AC200 V ± 10 %). • Check compressor system wiring, particularly for open phase. • Check connection of connectors / terminals on A3-IPDU P.C. board. • Check conductivity of case heater. (Check for refrigerant entrapment inside compressor.) • Check for defect in outdoor P.C. board (A3-IPDU). • Check outdoor MG-CTT.
H03	H03	01: Compressor 1 side 02: Compressor 2 side 03: Compressor 3 side	IPDU	Current detection circuit error	All stop	Current flow of at least specified magnitude is detected despite inverter compressor having been shut turned off.	• Check current detection circuit wiring. • Check defect in outdoor P.C. board (A3-IPDU).
H05	H05	—	I/F	TD1 sensor miswiring (incomplete insertion)	All stop	Discharge temperature of compressor 1 (TD1) does not increase despite compressor being in operation.	• Check installation of TD1 sensor. • Check connection of TD1 sensor connector and wiring. • Check resistance characteristics of TD1 sensor. • Check for defect
H06	H06	—	I/F	Activation of low-pressure protection	All stop	Low-pressure Ps sensor detects operating pressure lower than 0.02 MPa.	• Check service valves to confirm full opening (both gas and liquid sides). • Check outdoor PMVs for clogging (PMV1, 2). • Check for defect in SV2 or SV4 circuits. • Check for defect in low pressure Ps sensor. • Check indoor filter for clogging. • Check valve opening status of indoor PMV. • Check refrigerant piping for clogging. • Check operation of outdoor fan (during heating). • Check for insufficiency in refrigerant quantity.
H07	H07	—	I/F	Low oil level protection	All stop	Operating compressor detects continuous state of low oil level for about 2 hours.	<All outdoor units in corresponding line to be checked> • Check balance pipe service valve to confirm full opening. • Check connection and installation of TK1, TK2, TK3, TK4, and TK5 sensors. • Check resistance characteristics of TK1, TK2, TK3, TK4, and TK5 sensors. • Check for gas or oil leak in same line. • Check for refrigerant entrapment inside compressor casing. • Check SV3A, SV3B, SV3C, SV3D, SV3E, and SV3F valves for defect. • Check oil return circuit of oil separator for clogging. • Check oil equalizing circuit for clogging.

MG-CTT: Magnet contactor

Check code			Location of detection	Description	System status	Error detection condition(s)	Check items (locations)
Main remote controller	Outdoor 7-segment display						
	Check code	Sub-code					
H08	H08	01: TK1 sensor error 02: TK2 sensor error 03: TK3 sensor error 04: TK4 sensor error 05: TK5 sensor error	I/F	Error in temperature sensor for oil level detection	All stop	Sensor resistance is infinity or zero (open / short circuit).	• Check connection of TK1 sensor connector. • Check resistance characteristics of TK1 sensor. • Check for defect in outdoor P.C. board (I/F).
					All stop	Sensor resistance is infinity or zero (open / short circuit).	• Check connection of TK2 sensor connector. • Check resistance characteristics of TK2 sensor. • Check for defect in outdoor P.C. board (I/F).
					All stop	Sensor resistance is infinity or zero (open / short circuit).	• Check connection of TK3 sensor connector. • Check resistance characteristics of TK3 sensor. • Check for defect in outdoor P.C. board (I/F).
					All stop	Sensor resistance is infinity or zero (open / short circuit).	• Check connection of TK4 sensor connector. • Check resistance characteristics of TK4 sensor. • Check for defect in outdoor P.C. board (I/F).
					All stop	Sensor resistance is infinity or zero (open / short circuit).	• Check connection of TK5 sensor connector. • Check resistance characteristics of TK5 sensor. • Check for defect in outdoor P.C. board (I/F).
H14	H14	—	I/F	Compressor 2 case thermo activation	All stop	Compressor 2 case thermo was activated.	• Check Compressor 2 case thermo circuit. (Connector, Wiring, Circuit board) • Open and check the service valve. (Gas side, Liquid side) • Check the outdoor PMV clogging (PMV1, 2). • Check the SV42 circuit. • Check the SV4 circuit (SV41 / 42 miswiring). • Check the opening status of indoor PMV. • Check the four-way valve error. • Check the refrigerant shortage.
H15	H15	—	I/F	TD2 sensor miswiring (incomplete insertion)	All stop	Air discharge temperature of (TD2) does not increase despite compressor 2 being in operation.	• Check installation of TD2 sensor. • Check connection of TD2 sensor connector and wiring. • Check resistance characteristics of TD2 sensor. • Check for defect in outdoor P.C. board (I/F).

Check code			Location of detection	Description	System status	Error detection condition(s)	Check items (locations)
Main remote controller	Outdoor 7-segment display						
	Check code	Sub-code					
H16	H16	SMMS-i (4 series) 01: TK1 oil circuit error 02: TK2 oil circuit error 03: TK3 oil circuit error 04: TK4 oil circuit error 05: TK5 oil circuit error	I/F	Oil level detection circuit error	All stop	No temperature change is detected by TK1 despite compressor 1 having been started.	• Check for disconnection of TK1 sensor. • Check resistance characteristics of TK1 sensor. • Check for connection error involving TK1, TK2, TK3, TK4, and TK5 sensors. • Check for faulty operation in SV3E or SV3F valve. • Check for clogging in oil equalizing circuit capillary and faulty operation in check valve. • Check for refrigerant entrapment inside compressor.
						No temperature change is detected by TK2 despite compressor 2 having been started.	• Check for disconnection of TK2 sensor. • Check resistance characteristics of TK2 sensor. • Check for connection error involving TK1, TK2, TK3, TK4, and TK5 sensors. • Check for faulty operation in SV3E or SV3F valve. • Check for clogging in oil equalizing circuit capillary and faulty operation in check valve. • Check for refrigerant entrapment inside compressor.
						No temperature change is detected by TK3 despite compressor 3 having been started.	• Check for disconnection of TK3 sensor. • Check resistance characteristics of TK3 sensor. • Check for connection error involving TK1, TK2, TK3, TK4, and TK5 sensors. • Check for faulty operation in SV3E or SV3F valve. • Check for clogging in oil equalizing circuit capillary and faulty operation in check valve. • Check for refrigerant entrapment inside compressor.
						No temperature change is detected by TK4 despite compressor having been started.	• Check for disconnection of TK4 sensor. • Check resistance characteristics of TK4 sensor. • Check for connection error involving TK1, TK2, TK3, TK4, and TK5 sensors. • Check for faulty operation in SV3E or SV3F valve. • Check for clogging in oil equalizing circuit capillary and faulty operation in check valve. • Check for refrigerant entrapment inside compressor.
						No temperature change is detected by TK5 despite compressor having been started.	• Check for disconnection of TK5 sensor. • Check resistance characteristics of TK5 sensor. • Check for connection error involving TK1, TK2, TK3, TK4, and TK5 sensors. • Check for faulty operation in SV3E valve. • Check for clogging in oil equalizing circuit capillary and faulty operation in check valve. • Check for refrigerant entrapment inside compressor.

Check code			Location of detection	Description	System status	Error detection condition(s)	Check items (locations)
Main remote controller	Outdoor 7-segment display						
	Check code	Sub-code					
H25	H25	—	I/F	TD3 sensor miswiring (incomplete insertion)	All stop	Air discharge temperature (TD3) does not increase despite compressor 3 being in operation.	• Check installation of TD3 sensor. • Check connection of TD3 sensor connector and wiring. • Check resistance characteristics of TD3 sensor. • Check for defect in outdoor P.C. board (I/F).
L02	L02	—	Indoor unit	Outdoor unit model mismatch error	Only the target unit stopped	An error was found on the outdoor unit model.	• Check the model name of the outdoor unit. • Check the miswiring of the communication line between indoor and outdoor.
L03	—	—	Indoor unit	Duplicated indoor header unit	Stop of corresponding unit	There is more than one header unit in group.	• Check indoor addresses. • Check for any change made to remote controller connection (group / individual) since indoor address setting.
L04	L04	—	I/F	Duplicated outdoor line address	All stop	There is duplication in line address setting for outdoor units belonging to different refrigerant piping systems.	• Check line addresses.
L05	—	—	I/F	Duplicated priority indoor unit (as displayed on priority indoor unit)	All stop	More than one indoor unit has been set up as priority indoor unit.	• Check display on priority indoor unit.
L06	L06	No. of priority indoor units	I/F	Duplicated priority indoor unit (as displayed on indoor unit other than priority indoor unit)	All stop	More than one indoor unit have been set up as priority indoor unit.	• Check displays on priority indoor unit and outdoor unit.
L07	—	—	Indoor unit	Connection of group control cable to standalone indoor unit	Stop of corresponding unit	There is at least one stand-alone indoor unit to which group control cable is connected.	• Check indoor addresses.
L08	L08	—	Indoor unit	Indoor group / addresses not set	Stop of corresponding unit	Address setting has not been performed for indoor units.	• Check indoor addresses. **Note:** **This code is displayed when power is turned on for the first time after installation.**
L09	—	—	Indoor unit	Indoor capacity not set	Stop of corresponding unit	Capacity setting has not been performed for indoor unit.	Set indoor capacity. (DN = 11)
L10	L10	—	I/F	Outdoor capacity not set	All stop	Jumper wire provided on P.C. board for servicing I/F P.C. board has not been removed as required for given model.	Check model setting of P.C. board for servicing outdoor I/F P.C. board.
L17	L17	Target indoor address	I/F	Outdoor unit model mismatch error		The outdoor unit model is duplicate. The Cool/Heat Flex series 1/2 are duplicate.	• Check the outdoor unit model.
L18	L18	—	I/F	Cool / heat switch unit error	Only the target unit stopped	The heating operation was performed without the coolonly setting configured in a cool-only room where a cool / heat switch unit is not connected.	• Check the remote controller setting. (DN="0F") • Check the cool / heat switching unit. Check the piping connection of the switching unit. (Miswiring of discharge gas / suction gas) Check the SVS / SVD valve miswiring / misinstallation.

<table>
<tr><th colspan="3">Check code</th><th rowspan="2">Location of detection</th><th rowspan="2">Description</th><th rowspan="2">System status</th><th rowspan="2">Error detection condition(s)</th><th rowspan="2">Check items (locations)</th></tr>
<tr><th rowspan="2">Main remote controller</th><th colspan="2">Outdoor 7-segment display</th></tr>
<tr><th>Check code</th><th>Sub-code</th></tr>
<tr><td>L20</td><td>—</td><td>—</td><td>AI-NET Indoor unit</td><td>Duplicated central control address</td><td>All stop</td><td>There is duplication in central control address setting.</td><td>• Check central control addresses.
• Check network adaptor P.C. board (applicable to AI-NET).</td></tr>
<tr><td>L28</td><td>L28</td><td>—</td><td>I/F</td><td>Too many outdoor units connected</td><td>All stop</td><td>There are more than four outdoor units.</td><td>• Check No. of outdoor units connected (Only up to 4 units per system allowed).
• Check communication lines between outdoor units.
• Check for defect in outdoor P.C. board (I/F).</td></tr>
<tr><td>L29</td><td>L29</td><td>SMMS-i (Series 4)
<table><tr><th></th><th colspan="3">A3-IPDU</th><th>Fan IPDU</th></tr><tr><th></th><th>1</th><th>2</th><th>3</th><th></th></tr><tr><td>01</td><td>O</td><td></td><td></td><td></td></tr><tr><td>02</td><td></td><td>O</td><td></td><td></td></tr><tr><td>03</td><td>O</td><td>O</td><td></td><td></td></tr><tr><td>04</td><td></td><td></td><td>O</td><td></td></tr><tr><td>05</td><td>O</td><td></td><td>O</td><td></td></tr><tr><td>06</td><td></td><td>O</td><td>O</td><td></td></tr><tr><td>07</td><td>O</td><td>O</td><td>O</td><td></td></tr><tr><td>08</td><td></td><td></td><td></td><td>O</td></tr><tr><td>09</td><td>O</td><td></td><td></td><td>O</td></tr><tr><td>0A</td><td></td><td>O</td><td></td><td>O</td></tr><tr><td>0B</td><td>O</td><td>O</td><td></td><td>O</td></tr><tr><td>0C</td><td></td><td></td><td>O</td><td>O</td></tr><tr><td>0D</td><td>O</td><td></td><td>O</td><td>O</td></tr><tr><td>0E</td><td></td><td>O</td><td>O</td><td>O</td></tr><tr><td>0F</td><td>O</td><td>O</td><td>O</td><td>O</td></tr></table>Symbol O signifies site of IPDU error.</td><td>I/F</td><td>Error in No. of IPDUs</td><td>All stop</td><td>Insufficient number of IPDUs are detected when power is turned on.</td><td>• Check model setting of P.C. board for servicing outdoor I/F P.C. board.
• Check connection of UART communication connector.
• Check A3-IPDU, fan IPDU, and I/F P.C. board for defect.</td></tr>
<tr><td>L30</td><td>L30</td><td>Detected indoor address</td><td>Indoor unit</td><td>External interlock of indoor unit</td><td>Stop of corresponding unit</td><td>• Signal is present at external error input terminal (CN80) for 1 minute.</td><td>When external device is connected to CN80 connector:
1) Check for defect in external device.
2) Check for defect in indoor P.C. board.
When external device is not connected to CN80 connector:
1) Check for defect in indoor P.C. board.</td></tr>
<tr><td>—</td><td>L31</td><td>—</td><td>I/F</td><td>Extended IC error</td><td>Continued operation</td><td>There is part failure in P.C. board (I/F).</td><td>Check outdoor P.C. board (I/F).</td></tr>
<tr><td>P01</td><td>—</td><td>—</td><td>Indoor unit</td><td>Indoor fan motor error</td><td>Stop of corresponding unit</td><td></td><td>• Check the lock of fan motor (AC fan).
• Check wiring.</td></tr>
<tr><td>P03</td><td>P03</td><td>—</td><td>I/F</td><td>Discharge temperature TD1 error</td><td>All stop</td><td>Discharge temperature (TD1) exceeds 115 ˚C.</td><td>• Check outdoor service valves (gas side, liquid side) to confirm full opening.
• Check outdoor PMVs (PMV1, 2, 4) for clogging.
• Check resistance characteristics of TD1 sensor.
• Check for insufficiency in refrigerant quantity.
• Check for defect in 4-way valve.
• Check for leakage of SV4 circuit.
• Check SV4 circuit (wiring or installation error in SV41, SV42 or SV43).</td></tr>
</table>

Check code			Location of detection	Description	System status	Error detection condition(s)	Check items (locations)
Main remote controller	Outdoor 7-segment display						
	Check code	Sub-code					
P04	P04	01: Compressor 1 side 02: Compressor 2 side 03: Compressor 3 side	IPDU	Activation of high-pressure SW	All stop	High-pressure SW is activated.	• Check connection of high-pressure SW connector. • Check for defect in Pd pressure sensor. • Check outdoor service valves (gas side, liquid side) to confirm full opening. • Check for defect in outdoor fan. • Check for defect in outdoor fan motor. • Check outdoor PMVs (PMV1, 2) for clogging. • Check indoor / outdoor heat exchangers for clogging. • Check for short-circuiting of outdoor suction / discharge air flows. • Check SV2 circuit for clogging. • Check for defect in outdoor P.C. board (I/F). • Check for error in indoor fan system (possible cause of air flow reduction). • Check opening status of indoor PMV. • Check indoor-outdoor communication line for wiring error. • Check for faulty operation of check valve in discharge pipe convergent section. • Check gas balancing SV4 valve circuit. • Check SV5 valve circuit. • Check for refrigerant overcharging.
P05	P05	SMMS-i (Series 4) 00:	I/F	Detection of open phase / phase sequence	All stop	• Open phase is detected when power is turned on. • Inverter DC voltage is too high (overvoltage) or too low (undervoltage).	• Check for defect in outdoor P.C. board (I/F).
		01: Compressor 1 side 02: Compressor 2 side 03: Compressor 3 side		Inverter DC voltage (Vdc) error (compressor) MG-CTT error			
P07	P07	01: Compressor 1 side 02: Compressor 2 side 03: Compressor 3 side	IPDU I/F	Heat sink overheating error	All stop	Temperature sensor built into IGBT (TH) is overheated.	• Check power supply voltage. • Check outdoor fan system error. • Check heat sink cooling duct for clogging. • Check IGBT and heat sink for thermal performance for faulty installation. (e.g. mounting screws and thermal conductivity) • Check for defect in A3-IPDU. (faulty IGBT built-in temperature sensor (TH))
P10	P10	Detected indoor address	Indoor unit	Indoor overflow error	All stop	• Float switch operates. • Float switch circuit is open-circuited or disconnected at connector.	• Check float switch connector. • Check operation of drain pump. • Check drain pump circuit. • Check drain pipe for clogging. • Check for defect in indoor P.C. board.

Check code			Location of detection	Description	System status	Error detection condition(s)	Check items (locations)
Main remote controller	Outdoor 7-segment display						
	Check code	Sub-code					
P12	—	—	Indoor unit	Indoor fan motor error	Stop of corresponding unit	• Motor speed measurements continuously deviate from target value. • Overcurrent protection is activated.	• Check connection of fan connector and wiring. • Check for defect in fan motor. • Check for defect in indoor P.C. board. • Check impact of outside air treatment (OA).
P13	P13	—	I/F	Outdoor liquid backflow detection error	All stop	<During cooling operation> When system is in cooling operation, high pressure is detected in follower unit that has been turned off. <During heating operation> When system is in heating operation, outdoor PMV 1 or 2 continuously registers opening of 100p or less while under SH control.	• Check full-close operation of outdoor PMV (1, 2, 4). • Check for defect in Pd or Ps sensor. • Check gas balancing circuit (SV2) for clogging. • Check balance pipe. • Check SV3B circuit for clogging. • Check defect in outdoor P.C. board (I/F). • Check capillary of oil separator oil return circuit for clogging. • Check for leakage of check valve in discharge pipe convergent section.
P15	P15	01: TS condition	I/F	Gas leakdetection (TS1 condition)	All stop	Protective shutdown due to sustained suction temperature at or above judgment criterion for at least 10 minutes is repeated four times or more. <TS error judgment criterion> In cooling operation: 60 ˚C In heating operation: 40 ˚C	• Check for insufficiency in refrigerant quantity. • Check outdoor service valves (gas side, liquid side) to confirm full opening. • Check PMVs (PMV1, 2) for clogging. • Check resistance characteristics of TS1 sensor. • Check for defect in 4-way valve. • Check SV4 circuit for leakage
		02: TD condition	I/F	Gas leak detection (TD condition)	All stop	Protective shutdown due to sustained discharge temperature (TD1, TD2 or TD3) at or above 108 ˚C for at least 10 minutes is repeated four times or more.	• Check for insufficiency in refrigerant quantity. • Check PMVs (PMV 1, 2) for clogging. • Check resistance characteristics of TD1, TD2 and TD3 sensors. • Check indoor filter for clogging. • Check piping for clogging. • Check SV4 circuit (for leakage or coil installation error).
P17	P17	—	I/F	Discharge temperature TD2 error	All stop	Discharge temperature (TD2) exceeds 115 ˚C.	• Check outdoor service valves (gas side, liquid side) to confirm full opening. • Check outdoor PMVs (PMV1, 2, 4) for clogging. • Check resistance characteristics of TD2 sensor. • Check for defect in 4-way valve. • Check SV4 circuit for leakage. • Check SV4 circuit (for wiring or installation error involving SV41, SV42 and SV43).

Check code			Location of detection	Description	System status	Error detection condition(s)	Check items (locations)
Main remote controller	Outdoor 7-segment display						
	Check code	Sub-code					
P18	P18	—	I/F	Discharge temperature TD3 error	All stop	Discharge temperature (TD3) exceeds 115 ˚C.	• Check outdoor service valves (gas side, liquid side) to confirm full opening. • Check outdoor PMVs (PMV1, 2, 4) for clogging. • Check resistance characteristics of TD3 sensor. • Check for defect in 4-way valve. • Check SV43 circuit for leakage. • Check SV4 circuit (for wiring or installation error involving SV41, SV42 and SV43).
P19	P19	Detected outdoor unit No.	I/F	4-way valve reversing error	All stop	Abnormal refrigerating cycle data is collected during heating operation.	• Check for defect in main body of 4-way valve. • Check for coil defect in 4-way valve and loose connection of its connector. • Check resistance characteristics of TS1 and TE1 sensors. • Check output voltage characteristics of Pd and Ps pressure sensors. • Check for wiring error involving TE1 and TL sensors.
P20	P20	—	I/F	Activation of high-pressure protection	All stop	Pd sensor detects pressure equal to or greater than 3.6 MPa.	• Check for defect in Pd pressure sensor. • Check service valves (gas side, liquid side) to confirm full opening. • Check for defect in outdoor fan. • Check for defect in outdoor fan motor. • Check outdoor PMVs (PMV1, 2, 4) for clogging. • Check indoor / outdoor heat exchangers for clogging. • Check for short-circuiting of outdoor suction / discharge air flows. • Check SV2 circuit for clogging. • Check for defect in outdoor P.C. board (I/F). • Check for defect in indoor fan system (possible cause of air flow reduction). • Check opening status of indoor PMV. • Check indoor-outdoor communication line for wiring error. • Check for faulty operation of check valve in discharge pipe convergent section. • Check gas balancing SV4 valve circuit. • Check SV5 valve circuit. • Check for refrigerant overcharging.

Check code			Location of detection	Description	System status	Error detection condition(s)	Check items (locations)
Main remote controller	Outdoor 7-segment display						
	Check code	Sub-code					
P22	P22	SMMS-i (Series 4) 0∗: IGBT circuit 1∗: Position detection circuit error 3∗: Motor lockup error 4∗: Motor current detection C∗: TH sensor temperature error D∗: TH sensor error E∗: Inverter DC voltage error (outdoor fan) **Note:** **Although letters 0 to F appear at locations indicated by "∗", please ignore them.**	IPDU	Outdoor fan IPDU error	All stop	(Sub code: 0∗) Fan IPDU over current protection circuit Flow of current equal to or greater than the specified value is detected during startup of the fan.	• Check fan motor. • Check for defect in fan IPDU P.C. board.
					All stop	(Sub code: 1∗) Fan IPDU position detection circuit Position detection is not going on normally.	• Check fan motor. • Check connection of fan motor connector. • Check for defect in fan IPDU P.C. board.
					All stop	(Sub code: 3∗) Gusty wind, an obstruction, or another external factor Speed estimation is not going on normally.	• Check fan motor. • Check for defect in fan IPDU P.C. board.
					All stop	(Sub code: 4∗) Fan IPDU over current protection circuit Flow of current equal to or greater than the specified value is detected during operation of the fan.	• Check fan motor. • Check connection of fan motor connector. • Check for defect in fan IPDU P.C. board.
					All stop	(Sub code: C∗) Higher temperature than the specified value is detected during operation of the fan.	• Check fan motor. • Check for defect in fan IPDU P.C. board.
					All stop	(Sub code: D∗) The resistance value of the sensor is infinite or zero (open or short circuit).	• Check for defect in fan IPDU P.C. board.
					All stop	(Sub code: E∗) Fan IPDU DC voltage protection circuit The DC voltage higher or lower than the specified value is detected.	• Check power voltage of the main power supply. • Check for defect in fan IPDU P.C. board. • Check connection of fan IPDU P.C. board.
P26	P26	01: Compressor 1 side 02: Compressor 2 side 03: Compressor 3 side	IPDU	G-TR short-circuit protection error	All stop	Overcurrent is momentarily detected during startup of compressor.	• Check connector connection and wiring on A3-IPDU P.C. board. • Check for defect in compressor (layer short-circuit). • Check for defect in outdoor P.C. board (A3-IPDU).
P29	P29	01: Compressor 1 side 02: Compressor 2 side 03: Compressor 3 side	IPDU	Compressor position detection circuit error	All stop	Position detection is not going on normally.	• Check wiring and connector connection. • Check for compressor layer short-circuit. • Check for defect in A3-IPDU P.C. board.
P31	—	—	Indoor unit	Other indoor error (group follower unit error)	Stop of corresponding unit	There is error in other indoor unit in group, resulting in detection of E07/L07/L03/L08.	• Check indoor P.C. board.

Errors detected by TCC-LINK central control device

Indoor unit (including Hot Water Module)

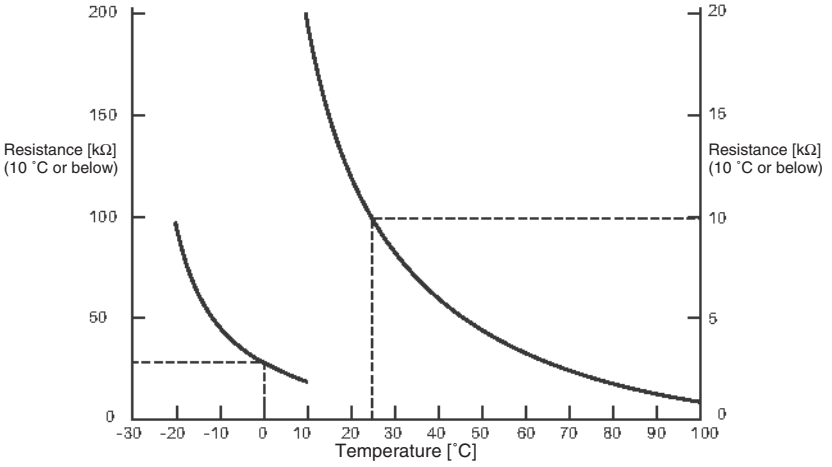
Check code			Location of detection	Description	System status	Error detection condition(s)	Check items (locations)
Main remote controller	Outdoor 7-segment display						
	Sub-code						
C05	—	—	TCC-LINK	TCC-LINK central control device transmission error	Continued operation	Central control device is unable to transmit signal.	• Check for defect in central control device. • Check for defect in central control communication line. • Check termination resistance setting.
C06	—	—	—	TCC-LINK central control device reception error	Continued operation	Central control device is unable to receive signal.	• Check for defect in central control device. • Check for defect in central control communication line. • Check termination resistance setting. • Check power supply for devices at other end of central control communication line. • Check defect in P.C. boards of devices at other end of central control communication line.
C12	—	—	General-purpose device I/F	Blanket alarm for general-purpose device control interface	Continued operation	Error signal is input to control interface for general-purpose devices.	• Check error input.
P30	Differs according to nature of alarm-causing error		TCC-LINK	Group control follower unit error	Continued operation	Error occurs in follower unit under group control. ([P30] is displayed on central control remote controller.)	• Check check code of unit that has generated alarm.
	(L20 displayed.)		—	Duplicated central control address	Continued operation	There is duplication in central control addresses.	• Check address settings.

8-5. Sensor characteristics

Indoor unit

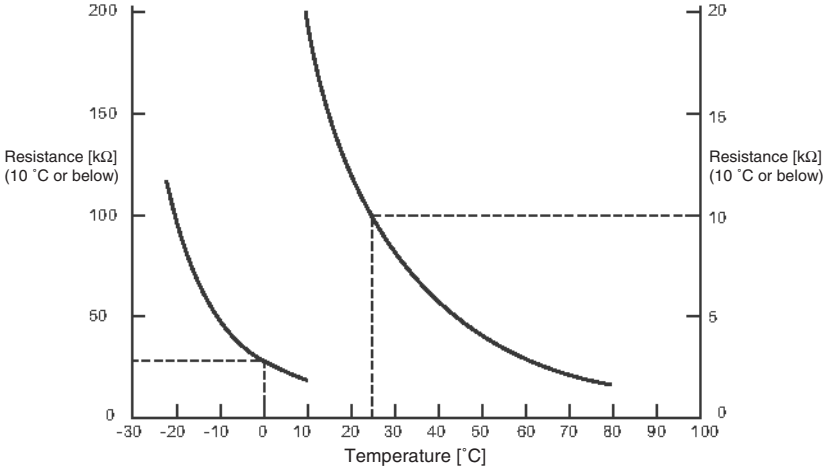
▼Temperature sensor characteristics

TC1sensor



Temperature [˚C]	Resistance [kΩ]
-20	99.9
-15	74.1
-10	55.6
-5	42.2
0	32.8
5	25.4
10	19.8
15	15.6
20	12.4
25	10.0
30	8.1
35	6.5
40	5.3
45	4.4
50	3.6
55	3.0
60	2.5
65	2.1
70	1.8
75	1.5
80	1.3
85	1.1
90	1.0
95	0.8
100	0.7

TA(TWI), TF(TCJ2), TCJ and TC2(TWO) sensor



Temperature [˚C]	Resistance [kΩ]
-20	115.2
-15	84.2
-10	62.3
-5	46.6
0	35.2
5	26.9
10	20.7
15	16.1
20	12.6
25	10.0
30	8.0
35	6.4
40	5.2
45	4.2
50	3.5
55	2.8
60	2.4
65	2.0
70	1.6
75	1.4
80	1.2

9. P.C. BOARD EXCHANGE PROCEDURES

■ Hot water module

Replacement of Hot water module P.C. boards

Part code	Model type	P.C. board type
431-6V-529	MMW-AP∗∗∗1LQ series	MCC-1403

Points to note when replacing hot water module P.C. board assembly

The electrically erasable programmable read-only memory (hereinafter EEPROM, IC10) mounted on a P.C. board holds important setting data, including the type and capacity codes intrinsic to the model (set at the factory), as well as the line / indoor (including hot water module) / group addresses, and the like (during installation, either automatically or manually). Proceed with the replacement of a P.C. board assembly in accordance with the procedure described below.
After completion of the work, check the settings again, including the hot water module No. and group header / follower designation, and confirm the integrity of the refrigerating cycle by conducting a test operation, etc.

<Replacement procedure>

Method 1

If it is possible to turn on the hot water module and read the setting data from the P.C. board to be replaced via a wired remote controller -

Reading EEPROM data: **Procedure 1**

⇩

Replacing P.C. board and turning on power: **Procedure 2**

⇩

Writing EEPROM data in new EEPROM: **Procedure 3**

⇩

Resetting power supply (applicable to all hot water module units connected to remote controller in case of group operation)

Method 2

If it is not possible to read the setting data due to the failure of the EEPROM itself -

Replacing P.C. board and turning on power: **Procedure 2**

⇩

Writing EEPROM data on basis of information supplied by customer (e.g. optional connection setting): **Procedure 3**

⇩

Resetting power supply (applicable to all hot water module units connected to remote controller in case of group operation)

Procedure 1: reading setting data from EEPROM

(Read the setting data from EEPROM, including both the factory settings and any modifications made to them on site.)

1 Push the TEST + SET + CL buttons simultaneously and hold for at least 4 seconds. (This number corresponds to the same number shown on the Remote Controller Operation Diagram.)

* In the case of group control, the unit No. displayed first is the indoor unit (including Hot Water Module) No. of the header unit.
At the same time, the CODE No. (DN code) 10 is displayed.

2 Each time the UNIT LOUVER button is pushed, one of the indoor unit (including Hot Water Module) No. under group control is displayed in turn.

* The fan of the selected indoor unit (including Hot Water Module) comes on, with the louvers swinging, depending on the model.

3 The TEMP. button allows you to move the CODE No. (DN code) up / down by one place.

4 First, change the CODE No. (DN code) from 10 to 03. (To set central control address)

Jot down the setting data displayed.

5 Change the CODE No. (DN code) using the TEMP. button.

Again, jot down the setting data displayed.

6 Repeat step 5 until all the setting data has been jotted down. (See the CODE No. list.)

* CODE No. (DN code) go from 01 to FF with a few gaps along the way.

7 When finished, push the TEST button to bring the system back to normal off state.

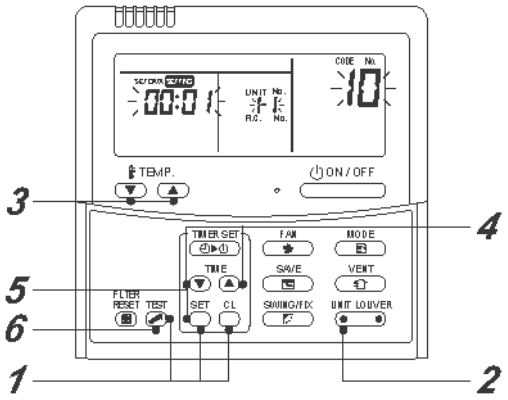
(It takes the system about 1 minute to become responsive to remote controller operation.)

CODE No. (DN code) necessary at minimum

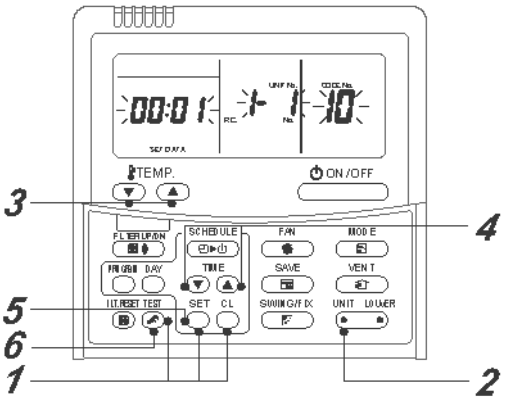
DN	Contents
10	Type
11	Indoor unit capacity
12	Line address
13	Indoor address
14	Group address

Remote controller operation diagram

<Fig. 1 RBC-AMT32E>



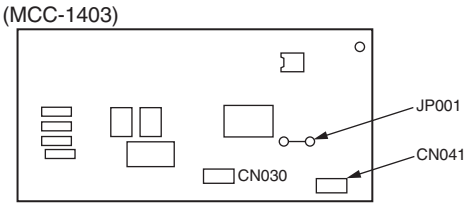
<Fig. 2 RBC-AMS41E>



Procedure 2: replacing P.C. board

1 Replace the faulty P.C. board with a service P.C. board.

Be sure to replicate the old jumper setting (removal) on the service P.C. board. (See the diagram at below.)



2 It is necessary to establish a one-to-one correspondence between the hot water module being serviced and the remote controller.

Turn on the hot water module using one of the methods described below according to the system configuration.

(1) Single (stand-alone) operation
Turn on the hot water module and proceed to **Procedure 3**.

(2) Group operation

A) If it is possible to selectively turn on the hot water module being serviced
Turn on the hot water module being serviced and proceed to **Procedure 3**.

B) If it is not possible to selectively turn on the hot water module being serviced (**Case 1**)

a) Temporarily disconnect the group control wiring from terminals A and B of the hot water module being serviced.

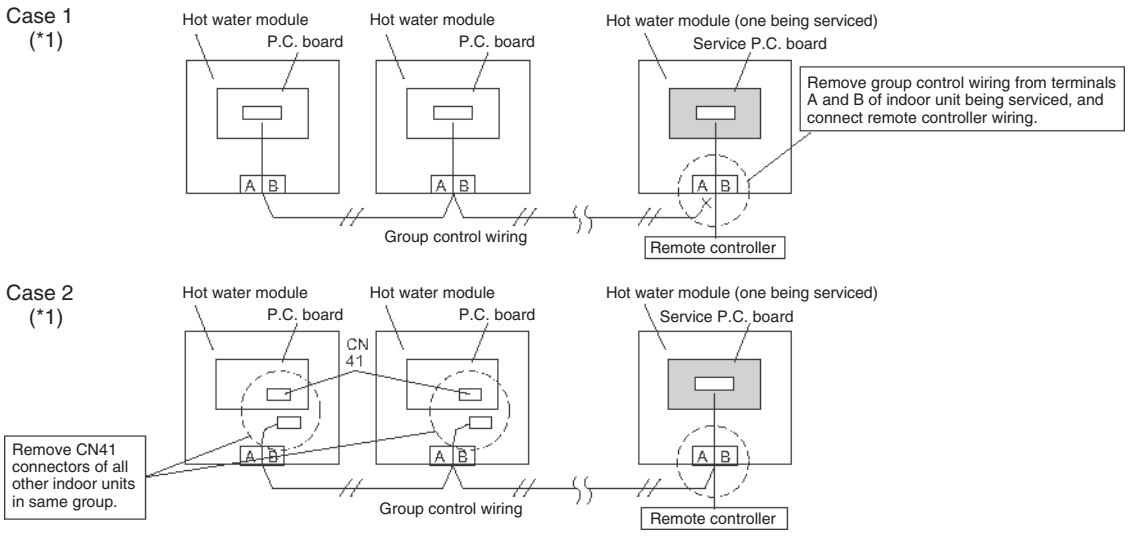
b) Connect the remote controller wiring to the terminals, turn on the hot water module, and proceed to **Procedure 3**.

***** If this method cannot be used, proceed to the alternative method described below (**Case 2**).

C) If it is not possible to selectively turn on the hot water module being serviced (**Case 2**)

a) Remove the CN41 connectors of all other hot water modules in the same group.

b) Turn on the hot water module and proceed to **Procedure 3**.



***** Be sure to restore the temporarily removed group control wiring and CN41 connectors to their initial states after Procedure 3 has been completed.

(*****1) Hot water module can connect up to two units in one refrigerative system.

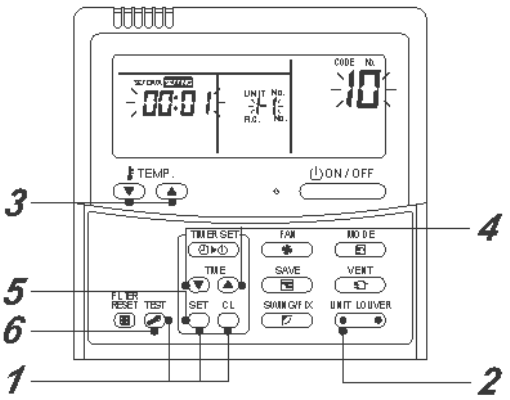
Procedure 3: writing setting data in EEPROM

(The EEPROM of the service P.C. board has been set to the factory default values.)

1 **Push the TEST + SET + CL buttons simultaneously and hold for at least 4 seconds. (This number corresponds to the same number shown on the Remote Controller Operation Diagram.)**

(Under UNIT No., ALL is displayed.)
At the same time, the CODE No. (DN code) 10 is displayed.

<Fig. 1 RBC-AMT32E>



2 **Push the UNIT LOUVER button (left side of the button) to display the indoor unit (including Hot Water Module) No. one by one in the group control. Specify the indoor unit (including Hot Water Module) No. whose service PC board was replaced.**
(This operation is not available if the UNIT No. shows ALL .)

3 **The TEMP. button allows you to moved the CODE No.**

(DN code) up / down by one place.

4 **First, set the type and capacity codes of the hot water module.**

(Changing the type and capacity codes in EEPROM overwrites the factory default settings.)

(1) Set the CODE No. (DN code) to 10 (no change)
(2) Use the TIME button to select the type.
(0060 is for the hot water module type.) - See the CODE No. list.
(3) Push the SET button. (The display should change from flashing to steady.)
(4) Use the TEMP. button to set the CODE No. (DN code) to 11.
(5) Use the TIME button to set the capacity code.
(For example, 0011 is for the 027 type.) - See the CODE No. list.
(6) Push the SET button. (The display should change from flashing to steady.)
(7) Push the TEST button to bring the system back to normal off state.

5 **Next, write any setting changes made on-site after installation, such as address settings, in the EEPROM. Perform the tasks specified in step 1 again.**

6 **Use the TEMP. button to set the CODE No. (DN code) to 03 (To set central control address)**

7 **Check the value displayed with the value jotted down in Procedure 1 and information proved by the customer.**

(1) If there is a discrepancy, change the setting in accordance with the jotted-down value, and push the SET button.
(The display should change from flashing to steady.)
(2) If there is no discrepancy, do nothing.

8 **Use the TEMP. button to change the CODE No. (DN code).**

Again, check the value, and change the setting if necessary.

9 **Repeat steps 6 and 7 until all the settings are checked.**

10 **When finished, push the TEST button to bring the system back to normal off state.**

In the case of group operation, turn the unit off, reconnect the indoor-indoor group control wiring and CN41 connectors, and turn on all the indoor units (including Hot Water Module).
(It takes the system about 1 minute to become responsive to remote controller operation.)

* CODE No. (DN code) go from 01 to FF with a few gaps along the way.
If you realize you have wrongly corrected a certain setting after pushing the SET button, you can recover the initial value by pushing the CL button, provided that the CODE No. (DN code) is yet to be changed.

CODE No. list (Example)

CODE No. (DN)	Item	Setting data	Factory-set value
03	Central control address		0099: Not determined
10	Type		Depending on model type
11	Indoor unit capacity		Depending on capacity type
12	System address		0099: Not determined
13	Indoor unit address		0099: Not determined
14	Group address		0099: Not determined
28	Power failure automatic recovery		0000: None
60	Timer setting (wired remote controller)		0000: Standard

Type
Code No. [10]

Setup data	Type	Model abb. name
0060	Hot water module	MMW-AP✻✻✻✻LQ✻

Indoor unit capacity
CODE No. [11]

Setup data	model
0000*	Invalid
0011	027 type
0017	056 type

* The initial setup value of EEPROM installed on the service P.C. board

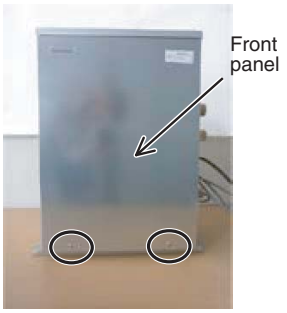
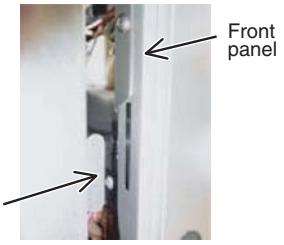
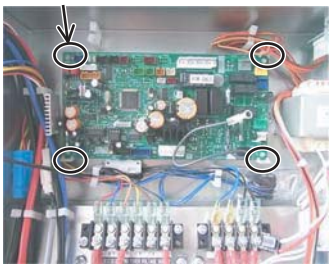
10. DETACHMENTS

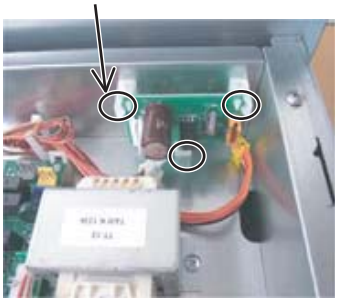
⚠ WARNING

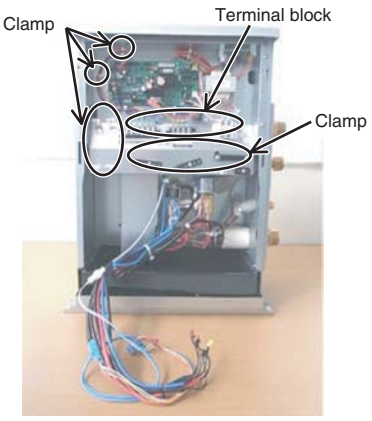
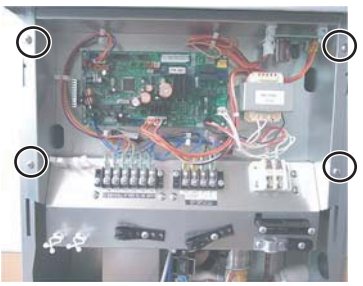
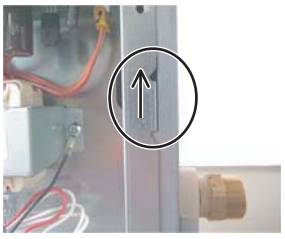
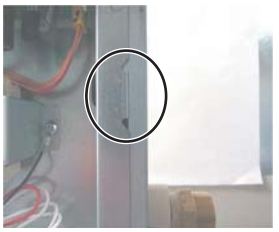
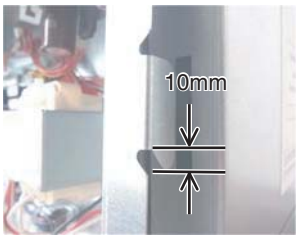
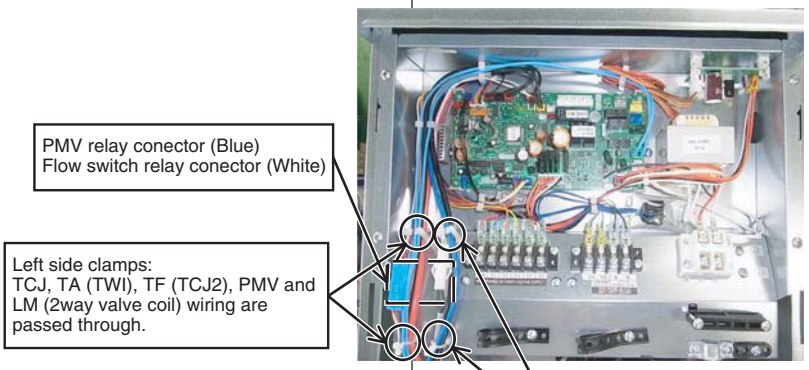
Stop the air conditioner(including HWM) operation, and turn off the circuit breaker.

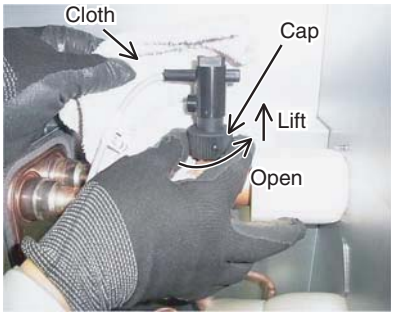
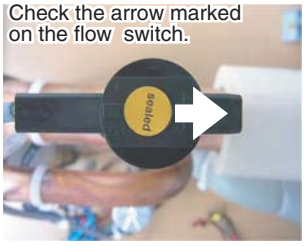
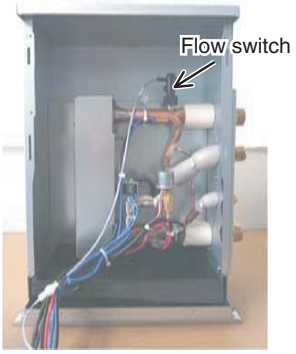
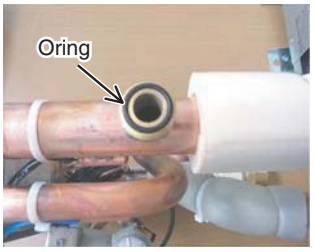
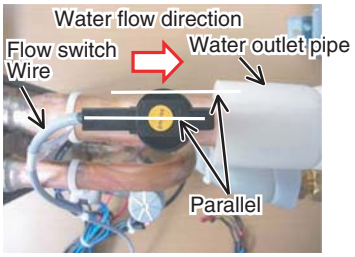
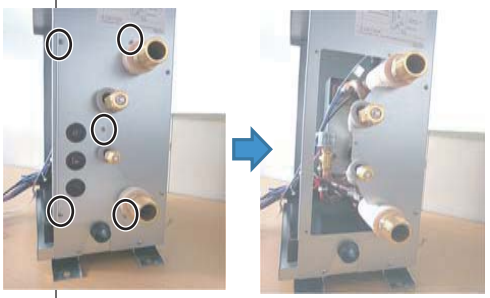
⚠ CAUTION

Wear a pair of gloves. Otherwise, you will risk an injury involving a replacement part or some other object.

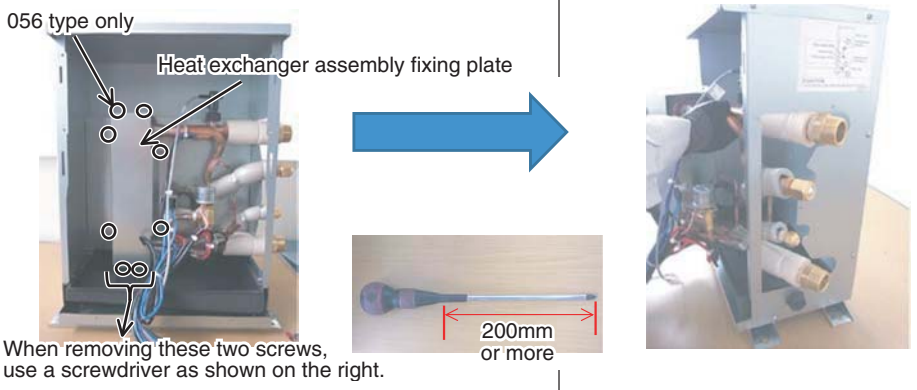
No.	Part to be replaced	Work procedure	Remarks
①	Front panel	**1. Detachment** 1) Remove the screws for the front panel.(4x10, 2pcs.) 2) Pull the front panel downward and then remove the front panel. **2. Attachment** 1) Carry out installation by following the detachment procedure in reverse. Be careful of the hook provided on the front panel.	 
②	P.C. board (MCC-1403)	**1. Detachment** 1) Carry out the detachment of item ① (Front panel). 2) Remove connectors which are connected from the control P.C.board to the other parts. CN030 .... FS(Flow switch) Red 3P CN033 .... LM(2way valve) Green 3P CN102 .... TCJ Red 2P CN101 .... TC2(TWO) Black 2P CN100 .... TC1 Brown 3P CN103 .... TF(TCJ2) Green 2P CN104 .... TA(TWI) Yellow 2P CN082 .... PMV Blue 6P CN067 .... AC IN Black 3P CN074 .... TRANS-P White 3P CN075 .... TRANS-S White 6P CN060 .... OPTION White 6P CN040 .... OC Blue 2P CN041 .... RC Blue 3P P301 ..... E Black Black Wire **⚠ CAUTION** Unlock the lock of the housing part and then remove the connector. 3) Unlock the locks of the card edge spacer (4 positions) and then remove the control P.C. board. **2. Attachment** 1) Carry out installation by following the detachment procedure in reverse.	Card edge spacer 

No.	Part to be replaced	Work procedure	Remarks
③	P.C. board (MCC-1520)	**1. Detachment** 1) Carry out the detachment of item ① (Front panel). 2) Remove connectors which are connected from the control P.C.board to the other parts. CN01 .... White 6P CN02 .... Yellow 6P **⚠ CAUTION** Unlock the lock of the housing part and then remove the connector. 3) Unlock the locks of the card edge spacer (3 positions) and then remove the control P.C. board. **2. Attachment** 1) Carry out installation by following the detachment procedure in reverse.	Card edge spacer 

No.	Part to be replaced	Work procedure	Remarks
④	Electrical control box	**1. Detachment** 1) Carry out the detachment of item ① (Front panel). 2) Remove connectors which are connected from the control P.C.board to the other parts and then remove wiring from the clamp. CN030 ... FS (Flow switch) Red 3P CN033 ... LM (2way valve) Green 3P CN102 ... TCJ Red 2P CN101 ... TC2 (TWO) Black 2P CN100 ... TC1 Brown 3P CN103 ... TF (TCJ2) Green 2P CN104 ... TA (TWI) Yellow 2P CN082 ... PMV Blue 6P 3) Remove wires which are connected to the terminal block and then remove wiring from the clamp. 4) Remove the screws for the electrical control box.(4x10, 4pcs.) 5) Lift the electrical control box up to about 10mm, pull the electrical control box and then remove the electrical control box. **⚠ CAUTION** Be careful of the hook provided on the Electrical control box to detach properly.	    
		2. Attachment 1) Carry out installation by following the detachment procedure in reverse. **NOTE:** • Let TCJ, TA (TWI), TF (TCJ2), PMV and LM (2way valve coil) wiring pass throuh the left side clamps. • Let TC1, TC2 (TWO) and FS (flow switch) wiring pass through the right side clamps. • Let PMV and FS (flow switch) relay connectors locate in the electrical control box.	

No.	Part to be replaced	Work procedure	Remarks
⑤	Flow switch	**1. Detachment** 1) Close the water supply source valve. 2) Carry out the detachment of item ④ (Electrical control box). 3) Slowly, turn the cap of flow switch completely and then lift the flow switch upward. **NOTE:** Use some clothes to avoid water dropping.  **2. Attachment** 1) Carry out installation by following the detachment procedure in reverse. **NOTE:** • The flow switch connection uses a O-ring for water seal. Be careful not to scratch the O-ring. Otherwise, water leakage may occur. • Place the flow switch parallel to the water outlet pipe. • The flow switch wire is placed on the right side. Refer to item ④ (Electrical control box). • Be careful to attach the proper flow switch as shown below. • After the flow switch replacement repair, open the water supply source valve and water piping valve to pass water through the unit, and check that the flow switch connection has no water leakage. • Carry out the work of air ventilation in water circuit.  	  
⑥	Pipe cover panel	**1. Detachment** 1) Remove wires which are connected to the terminal block and then remove wiring from the wiring port. 2) Remove the screws for the pipe cover panel.(4x10, 5pcs.) **2. Attachment** 1) Carry out installation by following the detachment procedure in reverse.	

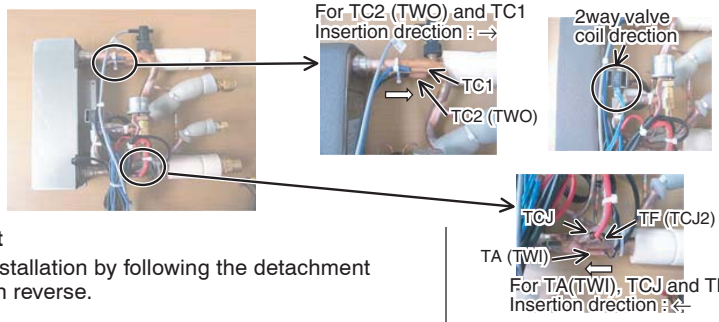
No.	Part to be replaced	Work procedure	Remarks
⑦	Heat exchanger assembly	**1. Detachment** 1) Close the water supply source valve and the valve of water pipe connected to the unit, carry out the refrigerant recovery and then remove the refrigerant and water pipes. 2) Carry out the detachment of item ④ (Electrical control box) and item ⑥ (pipe cover plate). 3) Remove the screws for the heat exchanger assembly fixing plate as shown below.(4x10, 7pcs.) For the unit for 056 type:4x10, 8pcs. 4) Remove the heat exchanger assembly from the unit as shown below.	


056 type only
Heat exchanger assembly fixing plate
When removing these two screws,
use a screwdriver as shown on the right.
200mm
or more

5) Remove sensors, 2way valve coil and flow switch attached the heat exchanger assembly.
6) Carry out installation by following the detachment procedure in reverse.

⚠ CAUTION

- Be careful in the insertion direction of attaching the sensor, as shown below.
- Be careful to attach the flow switch, as shown item ⑤ (flow switch).

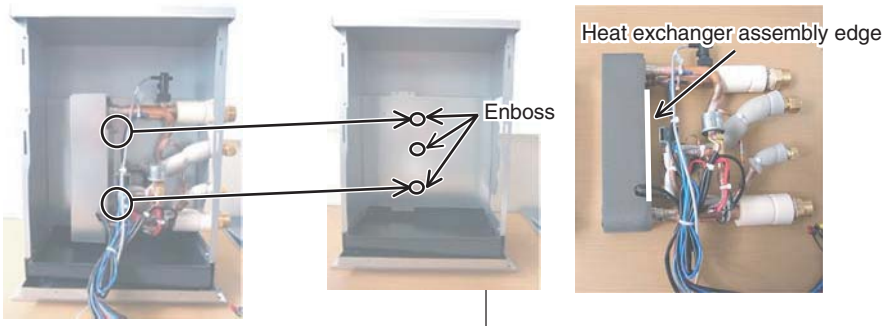


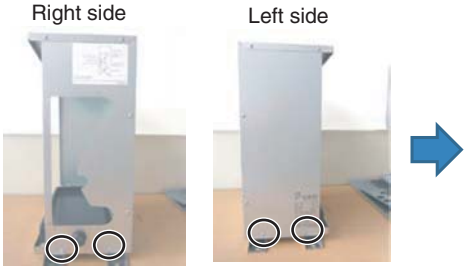
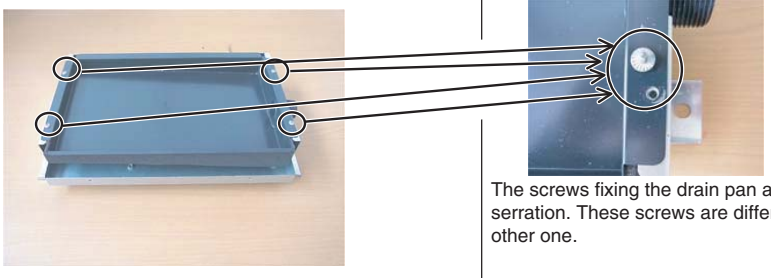
2. Attachment

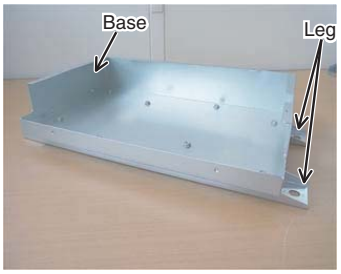
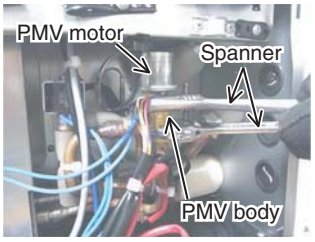
1) Carry out installation by following the detachment procedure in reverse.

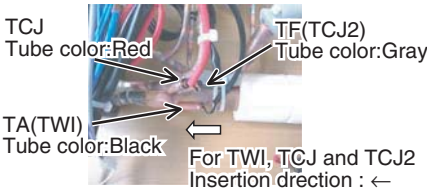
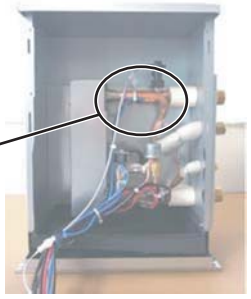
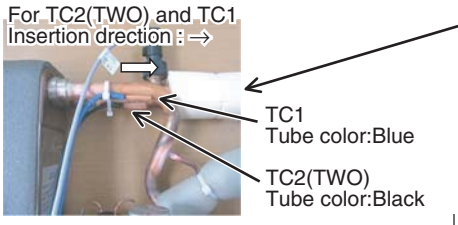
NOTE:

- To attach the heat exchanger assembly on the proper position, replace the heat exchanger assembly edge on the enboss, as shown below.



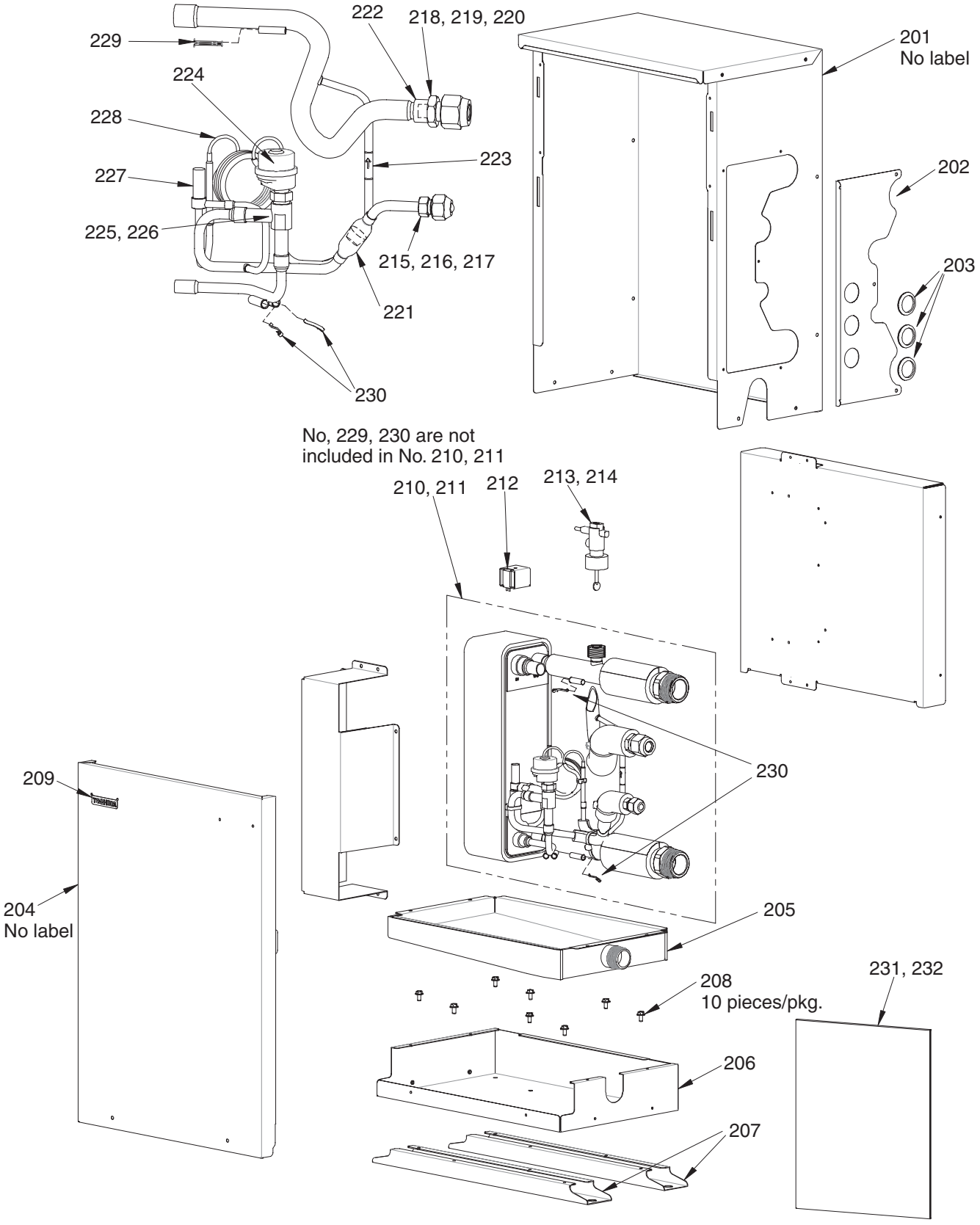
No.	Part to be replaced	Work procedure	Remarks
⑦	Heat exchanger assembly (Continued)	**⚠ CAUTION** After the vacuuming is completed, carry out the following procedure before adding refrigerant. • Plate heat exchanger may explode because the water in the plate heat exchanger frozen. To avoid this phenomenon, add refrigerant before carrying out a water supply to the water pipe system of the Hot water module. • After connecting the refrigerant pipes, check that the connection has no leakage, and then carry out vacuuming. • Control the tightening torque for the liquid side from 33 to 42 N•m, and the gas side is from 63 to 77 N•m. • After the heat exchanger assembly is replaced, open the water supply source valve and water piping valve to pass water through the unit, and check that the flow switch connection has no water leakage. • Carry out the work of air ventilation in water circuit.	
⑧	Cabinet	**1. Detachment** 1) Carry out the detachment of item ⑦ (Heat exchanger assembly). 2) Remove the screws for the cabinet and then remove the attachment plate, as shown below.(4x10, 4pcs.) 3) Remove the screws for the cabinet, tilt the cabinet and then lift the cabinet upward, as shown below.(4x10, 4pcs.)  **2. Attachment** 1) Carry out installation by following the detachment procedure in reverse.	
⑨	Drain pan	**1. Detachment** 1) Remove the drain pipe. 2) Carry out the detachment of item ⑧ (Cabinet). 3) Remove the screws for the drain pan.(4x10, 4pcs.) **⚠ CAUTION** • Be careful of using the different screw, as shown below.  **2. Attachment** 1) Carry out installation by following the detachment procedure in reverse.	 The screws fixing the drain pan are with serration. These screws are different from other one.

No.	Part to be replaced	Work procedure	Remarks
⑩	Base and legs	**1. Detachment** 1) Carry out the detachment of item ⑨ (Drain pan). 2) Remove the screws for the legs.(5x10, 8pcs.)  **2. Attachment** 1) Carry out installation by following the detachment procedure in reverse.	
⑪	2way valve coil	**1. Detachment** 1) Carry out the detachment of item ① (Front panel). 2) Remove connector which is connected from the control P.C.board to the other part and then remove wiring from the clamp. CN033 ... (LM) 2way valve Green 3P 3) Remove the screw for the 2way valve coil.(M5x6.5, 1pc.) **2. Attachment** 1) Carry out installation by following the detachment procedure in reverse. **NOTE:** • Control the tightening torque for the 2way valve coil to 2.0 ± 0.5N•m. • Be careful in the insertion direction of attaching the 2way valve coil, as shown below. • Let 2 way valve coil wiring pass through the letf side clamps. Refer to item ④ (Electrical control box).	 2way valve coil drection
⑫	PMV motor	**1. Detachment** 1) Carry out the detachment of item ① (Front panel). 2) Remove connector which is connected from the control P.C.board to the other part and then remove wiring from the clamp. CN082 ... PMV Blue 6P 3) Loosen the nuts fixing PMV motor with double spanner to remove PMV motor. **2. Attachment** 1) Carry out installation by following the detachment procedure in reverse. **NOTE** • Control the tightening torque for the PMV motor to 7.84 ± 0.98N•m. • Let PMV wiring pass through the letf side clamps. Refer to item ④ (Electrical control box).	

No.	Part to be replaced	Work procedure	Remarks
⑬	Sensor TCJ, TF(TCJ2) and TA(TWI)	**1. Detachment** 1) Carry out the detachment of item ① (Front panel). 2) Remove connectors which are connected from the control P.C.board to the other parts and then remove wiring from the clamp. CN102 .... TCJ Red 2P CN103 .... TF(TCJ2) Green 2P CN104 .... TA(TWI) Yellow 2P **2. Attachment** 1) Carry out installation by following the detachment procedure in reverse. **NOTE:** • Be careful in the insertion direction about attaching the sensor, as shown below. • Let TCJ, TA (TWI) and TF (TCJ2) wiring pass through the letf side clamps. Refer to item ④ (Electrical control box).	 
⑭	Sensor TC1 and TC2(TWO)	**1. Detachment** 1) Carry out the detachment of item ④ (Electrical control box). 2) Remove connectors which are connected from the control P.C.board to the other parts and then remove wiring from the clamp. CN101 ... TC2(TWO) Black 2P CN100 ... TC1 Brown 3P **2. Attachment** 1) Carry out installation by following the detachment procedure in reverse. **NOTE:** • Be careful in the insertion direction about attaching the sensor, as shown below. • Let TC1 and TC2(TWO) wiring pass through the right side clamps. Refer to item ④ (Electrical control box).	 

11. EXPLODED DIAGRAM / SERVICE PARTS LIST

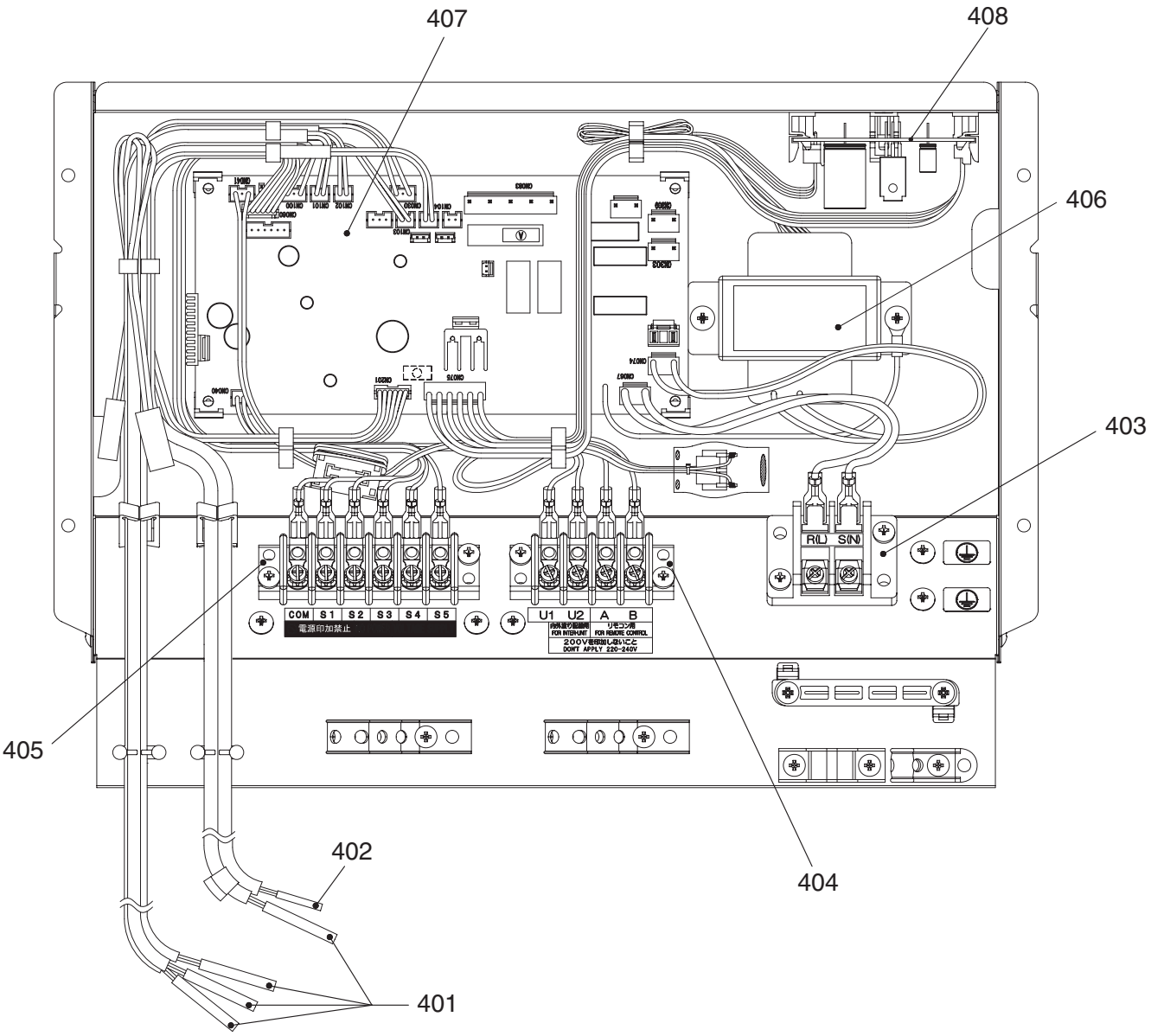
MMW-AP0271LQ-E, MMW-AP0561LQ-E
MMW-AP0271LQ-TR, MMW-AP0561LQ-TR



Location No.	Part No.	Description	Q fty/Set MMW-			
			AP0271 LQ-E	AP0561 LQ-E	AP0271 LQ-TR	AP0561 LQ-TR
201	4310A109	CABINET, MAIN	1	1	1	1
202	43119530	PANEL, PIPE COVER	1	1	1	1
203	43019830	BUSHING	3	3	3	3
204	4310A111	PANEL, FRONT	1	1	1	1
205	43172249	PAN, DRAIN	1	1	1	1
206	4310A110	BASE	1	1	1	1
207	4310A112	LEG	2	2	2	2
208	43197190	SCREW, SET M5 L10	1	1	1	1
209	37517876	MARK, TOSHIBA	1	1	1	1
210	4314J508	PIPE, ASSY, WATER HEAT EXCHANGER	1		1	
211	4314J509	PIPE, ASSY, WATER HEAT EXCHANGER		1		1
212	4314N047	COIL, VALVE, 2WAY, FQ-G593	1	1	1	1
213	37551737	SWITCH, FLOW	1		1	
214	37551735	SWITCH, FLOW		1		1
215	43049776	SOCKET	1	1	1	1
216	43149355	NUT, FLARE, 3/8, IN	1	1	1	1
217	43F47609	BONNET	1	1	1	1
218	43149354	SOCKET	1	1	1	1
219	43149352	NUT, FLARE, 5/8, IN	1	1	1	1
220	43194029	BONNET, 5/8 IN	1	1	1	1
221	43147664	STRAINER	1	1	1	1
222	4314Q114	STRAINER, SCREEN	1	1	1	1
223	37547751	VALVE, CHECKED, BCV-302DY	1	1	1	1
224	43146743	MOTOR, PMV, EFM-MD12TF-1	1	1	1	1
225	43146714	VALVE, PMV, EDM-B40YGTF-3	1		1	
226	43146723	BODY, PMV		1		1
227	4314N079	VALVE, 2WAY, FDF2A88	1	1	1	1
∗ 228	43047527	TUBE, CAPILLARY, ID2.0X2000L	1	1	1	1
229	43107215	HOLDER, SENSOR	1	1	1	1
230	43F19904	HOLDER, SENSOR (TS)	4	4	4	4
231	431S8295	OWNER'S MANUAL	1	1		
232	431S8296	OWNER'S MANUAL			1	1

∗ The capillary tube is provided as the service part with the length of 2000 mm. Paying proper regard to the burr or others, cut the tube to 1000 mm each to use it.

E-Parts

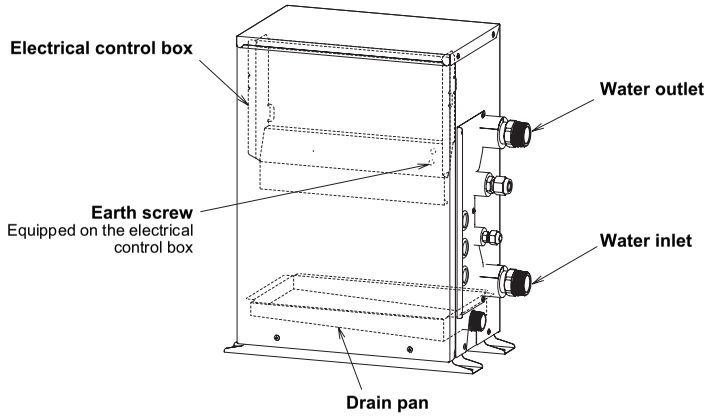


Location No.	Part No.	Description	Q fty/Set MMW-			
			AP0271 LQ-E	AP0561 LQ-E	AP0271 LQ-TR	AP0561 LQ-TR
401	43050425	SENSOR ASSY, SERVICE,TC(F6)	4	4	4	4
402	43150320	SENSOR ASSY, SERVICE,TG(F4)	1	1	1	1
403	43160626	TERMINAL BLOCK, 2P, 20A	1	1	1	1
404	43160561	TERMINAL,4P	1	1	1	1
405	43160548	TERMINAL,6P	1	1	1	1
406	43158187	TRANSFORMER, TT-13	1	1	1	1
407	4316V529	P.C.BOARD ASSY, MCC-1403	1	1	1	1
408	4316V247	P.C.BOARD ASSY, MCC-1520	1	1	1	1

12. OWNER'S MANUAL (EXCERPT)

2 Part names

■ Hot water module

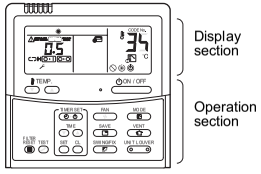


3 Part names and functions of the remote controller

■ Display section

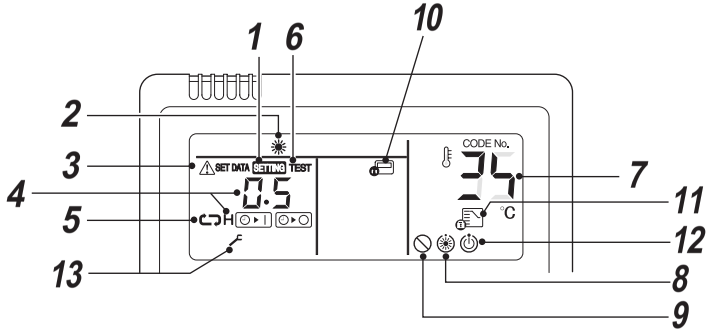
All indicators are displayed in the display example below.
Actually, only the selected options will be displayed.

- SETTING blinks on the display of the remote controller the first time the power switch is turned on.
- The initial settings progress while SETTING is blinking. Start to use the remote controller after SETTING has disappeared.



NOTE

The LCD may temporarily be blurred due to static electricity.



1 SETTING indicator
Displayed when setting the timer or other functions.

2 Operation mode indicator
Indicates the operation mode selected.

3 Error indicator
Displayed when the protective device activates or an error occurs.

4 Time display
Indicates time concerning the timer.
(Indicates an error code when an error occurs)

5 Timer mode indicator
Displays the timer mode.

6 TEST run indicator
Displayed during test run.

7 Set temperature display
The selected set temperature is displayed.

8 Pre-heat indicator
Displayed when defrost cycle is initiated.

9 No function indicator
Displayed when the function requested is not available on that model.

10 Central control indicator
Displayed when the air conditioner is controlled centrally and used with central control devices such as the central remote controller.
If the use of the remote controller is prohibited by the central control, blinks when the ON/OFF, MODE, or TEMP. button on the remote controller is pushed, and the buttons do not function.
(Settings that can be configured on the remote controller differ depending on the mode of the central control. For details, read the Owner's Manual of the central remote controller.)

11 Operation mode controlled indicator
Displayed when the operation mode is restricted.

12 Operation ready display
This display appears on some models.

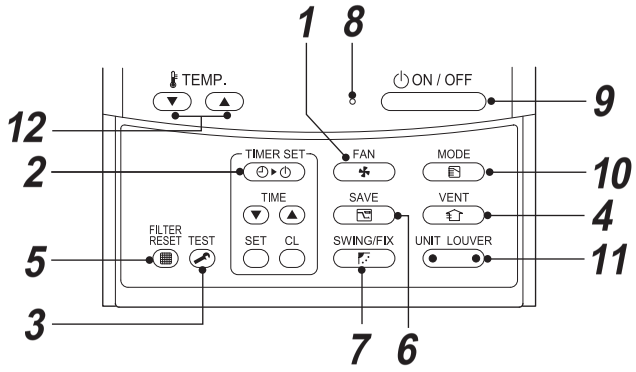
13 Service display
Displayed while the protective device works or an error occurs.

⚠ CAUTION

Remote controller sensor can not be used for the hot water module. Remote controller sensor has no function when remote controller is connected to the hot water module.

■ Operation section

Once the settings have been configured, all you need to do is push the ON / OFF button from then on.



1 FAN **button (Fan speed select button)**
No function.

2 TIMER SET **button (Timer set button)**
Use to setup the timer.

3 TEST **button (TEST button)**
Use only for service.
(During normal operation, do not use this button.)

4 VENT **button**
No function.

5 FILTER RESET **button (Filter reset button)**
No function.

6 SAVE **button (Power save operation)**
No function.

7 SWING/FIX **button**
No function.

8 **Operation lamp**
Lights up during running.
Blinks when an error occurs or the protective device activates.

9 ON / OFF **button**
Turns on the unit when pushed, and turns off when pushed again.

10 MODE **button (Operation mode select button)**
Heating mode is only available. Only heating symbol is displayed.

11 UNIT LOUVER **button (Unit / Louver select button)**
UNIT button:
No function.
LOUVER button:
No function.

12 TEMP. **button**
Adjusts the set temperature.
Select the desired set point by pushing TEMP. ▼ or TEMP. ▲

OPTION:
Remote controller sensor
Do not use “Remote controller sensor”.

4 Basic operation

When you use the hot water module for the first time or change the settings, follow the procedures below.
From next time, pushing the ON / OFF button starts running of the hot water module with the chosen settings.

■ Preparation

Turn on the power switch

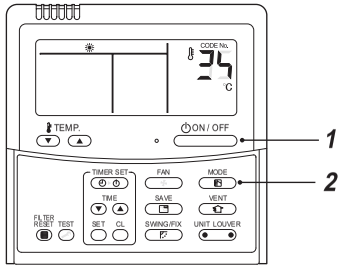
- When turned on, the separation line appears and SETTING blinks on the remote controller display.

* **The remote controller will not work for about 1 minute after turning on the power. This is not a malfunction.**

REQUIREMENT

- Keep the power switch turned on during use.
- When you resume using the hot water module after a long period of disuse, turn on the power switch at least 12 hours before starting running.

■ Operations



1 **Push the ON / OFF button.**
The operation lamp lights up.

2 **Push the “MODE MODE ” button to select a operation mode.**
Only heating symbol is displayed. Heating mode is only available.

☼ Heating

3 **Push the ON / OFF button to stop running.**
The operation lamp turns off.

■ Changing the set temperature

1 **Push the “TEMP. ▼ ▲” buttons.**
Push ▲ to increase the temperature, and ▼ to decrease the temperature.

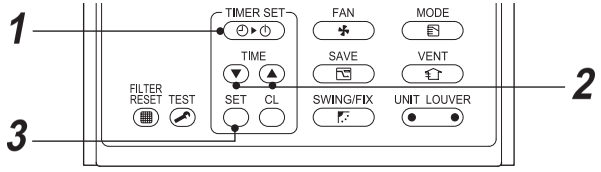
Operation mode	Setting range	Factory default
HEAT	25 to 50 °C	35 °C

5 Timer operation

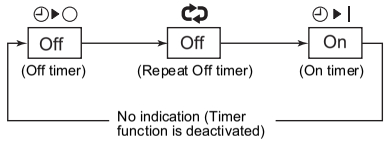
Select a timer type from the following three: (Max. 168 hours)

OFF timer	: Stops running after the specified period.
Repeat-OFF timer	: Stops running after the specified period every time you use the hot water module.
On timer	: Starts running after the specified period.

■ Setting the timer



1 Push the TIMER SET button.
Each time you push the button, the timer mode and indication change in the following order:



- SETTING and the time indicator blink.

2 Push the TIME buttons to set the period of time until the timer actions.
- The time setting increases in 0.5-hour (30-minute) increments each time you push ▲. The setting increases in 1-hour increments if it is over 1d (24 hours). The maximum is 7d (168 hours).
  On the remote controller, settings between 0.5h and 23.5h (*1) are displayed as is.
  If it is over 24 hours (*2), the days and hours appear.
- The time setting decreases in 0.5-hour (30-minute) decrements (0.5 hours to 23.5 hours) or 1-hour decrements (24 hours to 168 hours) each time you push ▼.

Example of remote controller display

- **23.5 hours (*1)**

- **34 hours (*2)**
  - 1d indicates 1 day (24 hours).
  - 10h indicates 10 hours. (Total: 34 hours)

3 Push the SET button.
SETTING disappears, the time indication is displayed, and ⏲▸| or ⏲▸○ display flashes.
(When using the ON timer, all indications other than the time and ⏲▸| turn off.)

■ Cancelling the timer

1 Push the button.
The timer indicator disappears.

NOTE

When using Repeat OFF timer, pushing the ON / OFF button after stopping by the timer starts running again and the timer will stop the running again after the specified period.

6 Installation

■ Location

- Avoid installing near machines emitting high frequency waves.
- Not suitable for chemical plants such as liquefied carbon dioxide refrigerant plants.
- Do not install the hot water module in locations where iron or other metal dust is present. If iron or other metal dust adheres to or collects on the interior of the hot water module, it may spontaneously combust and start a fire.
- A failure may occur in certain locations such as the following:
  - Areas with large amount of oil droplets (including machine oil) or vapors
  - Salty areas near oceans, etc.
  - Hot springs emitting sulfidizing gas, etc.
  - Heavily acidic or alkaline places.

  Special maintenance or parts are required for use in the above places. For details, contact the dealer where you purchased the product.
- Leave an enough space around the air intake and discharge of the outdoor unit so that the ventilation is not restricted.
- Avoid places where strong wind may blow against the air intake and discharge of the outdoor unit.
- Attach a snow stand, snow hood, etc. to the outdoor unit for use in snowfall areas. For details, contact the dealer where you purchased the product.
- Make sure drain water from the outdoor unit and the hot water module are emitted into places with good drainage.
- Keep a distance of at least 1 m between the hot water module / remote controller and a TV or radio. Failure to observe this precaution may cause visual disturbance or noise.
- Leave a distance of at least 1.5 m between the hot water module and a fire alarm. If this precaution is not observed, the alarm may not work properly or detect fire in case of fire.

■ Be careful of operation sounds

- Locate the unit in a place secure enough so that the sounds and vibrations do not increase.
- If something is placed near the air discharge of the outdoor unit, noise may increase.
- Be careful not to disturb your neighbors with cool / heat air or noise coming from the air discharge of the outdoor unit.

7 Notes on operations and performance

■ Check before operation

- Turn on the power switch at least 12 hours before starting operation.
- Make sure the earth wire is securely connected.

■ Defrosting during heating

- If frost falls on the outdoor unit during heating, defrosting is automatically performed (for approximately 2 - 10 minutes) to increase the heating effect.
- The hot water module outputs the pump operation during defrosting.

■ 3-minute protection

The outdoor unit will not operate for approximately 3 minutes after the air conditioner (including hot water module) has been immediately restarted after stopping, or the power switch has been turned on. This is to protect the system.

■ Power failure

- In the case of a power failure, all operations stop.
- To resume operations, push the ON/OFF button.

■ Protective device (High pressure switch)

The high pressure switch stops the air conditioner (including hot water module) automatically when excessive load is applied to the air conditioner system. If the protective device activates, the unit's running stops and the operation lamp blinks.
When the protective device activates, the indicator and the check code are displayed on the remote controller.

The protective device may activate in the following cases:

During cooling
- When the air intake or air discharge of the outdoor unit is blocked.
- When strong wind blows continuously against the air discharge of the outdoor unit.

During heating
- When dust or dirt is excessively adhered to the strainer (locally procured) of water pipe.
- When the water flow rate is lower.

NOTE

When the protective device activates, turn off the power switch, remove the cause, and then restart running.

■ Cooling / Heating operations

Each unit can be controlled individually. However, indoor units connected to the same outdoor unit cannot perform cooling and heating simultaneously.
When you attempt simultaneous operation, hot water module performing heating are stopped, and the running preparation indicator is displayed on the remote controller.
An indoor unit performing cooling continues running.
When you attempt an operation without the configured settings, the running preparation indicator is displayed on the remote controller and operation stops.
If operation is fixed to cooling or heating by the air conditioner administrator, only the configured settings apply to the operation.

■ Characteristics of heating

When the outside temperature increases, the outdoor unit may stop.

8 Maintenance

⚠ WARNING

For daily maintenance, make sure to ask the qualified service person particularly following models as the maintenance requires high-place work;

■ Cleaning the hot water module and remote controller

- Ask qualified service person to clean the hot water module for the models listed in the warning on the top of this chapter.
- Wipe with a dry, soft cloth.
- Do not use benzine, thinner, scouring powder, chemical cloth, etc. as those may cause deformation or breakage.

■ If unused for over a month

- Before a long period of none use, purge the water out of the pipes and thoroughly let them dry.
- Turn off the main power switch.

■ Periodic inspection

- After being used for a long period of time, the parts may deteriorate or malfunction, or the drainage may worsen, due to heat, moisture, dust, or general usage.
- In addition to the maintenance, it is recommended that you have a inspection (charges apply) performed by the dealer where you purchased the unit, etc.

■ Before the operating season

Ask a qualified service person to clean the drain pan.

⚠ CAUTION

Clean the drain pan

Without cleaning, the drain pan may be filled with waste, and water may overflow onto the floor.

9 Troubleshooting

When the following symptoms are found, check the points described below before asking repair servicing.

	Symptom		Cause
It is not a failure.	Outdoor unit	• White misty cold air or water is out.	• Fan of the outdoor unit stops automatically and performs defrost operation.
		• Sometimes, noise of air leak is heard.	• Solenoid valve works when defrost operation starts or finishes.
	Hot water module	• "Swish" sound is heard sometimes.	• When the operation has started, during the operation, or immediately after the operation has stopped, a sound such as water flows may be heard, and the operation sound may become larger for 2 or 3 minutes immediately after the operation has started. They are flowing sound of refrigerant or draining sound of dehumidifier.
		• "⏻" indication is lit.	• When heating operation cannot be performed because another indoor unit performs cooling operation. • Is outdoor temperature out of operation temperature range?
		• "" indication is lit.	• When the manager of the air conditioner or the hot water module has fixed the operation to COOL or HEAT, and an operation contrary to the setup operation is performed.
		• Sound is output from the stand by hot water module.	• Since refrigerant is flowed temporarily to prevent stay of oil or refrigerant, sound of flowing refrigerant may be heard when hot water module operates in HEAT mode.
	Pump, Line heater	• The pump and line heater operates automatically during hot water module is stand by.	• The pump and line heater operates for frost protection of water heat exchanger, when water temperature decreases or outdoor unit start operation or refrigerant (oil) recovery control.
		• When power of the hot water module is turned on, "Ticktock" sound is heard.	• Sound is generated when the expansion valve operates when power has been turned on.
		• LCD blurs when it is touched.	• LCD may temporarily blur by static electricity.
Check again.	Operates or stops automatically.		• Is the timer "ON" or "OFF"?
	Does not operate.		• Is it a power failure? • Is the power switch turned off? • Is the power fuse or breaker blown? • Has the protective device operated? (The operation lamp goes on.) • Is the timer "ON"? (The operation lamp goes on.) • Are COOL and HEAT selected simultaneously? ("⏻" indication is lit on the display of the remote controller.) • Is the outside air temperature outside of operating temperature range? The operation is automatically stopped ("⏻" on the remote controller display turns on).

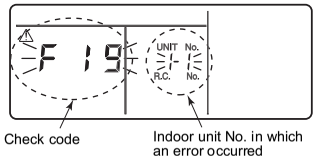
⚠ CAUTION

If any of the following conditions occur, turn off the main power supply switch and immediately contact the dealer:

- Switch operation does not work properly.
- The main power fuse often blows out, or the circuit breaker is often activated.
- A foreign matter or water fall inside the hot water module.
- When the hot water module does not operate even after the cause of the protective device activation has been removed. (The operation lamp and 🔧 on the remote controller are flashing.When 🔧 and a combination of R, E, F, H, L, or P and a number are displayed on the remote controller, also inform a qualified service person of the display content.)
- Any other unusual conditions are observed.

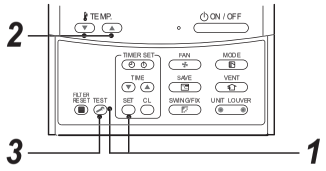
Confirmation and check

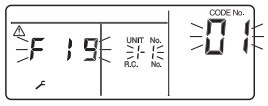
When an error occurred in the air conditioner or the hot water module, the check code and the indoor unit No. appear on the display part of the remote controller.
The check code is only displayed during the operation.
If the display disappears, operate the air conditioner or hot water module according to the following “Confirmation of error log” for confirmation.



Confirmation of error log

When an error occurred on the air conditioner or the hot water module, the error log can be confirmed with the following procedure. (The error log is stored in memory up to 4 errors.)
The log can be confirmed from both operating status and stop status.



Procedure	Description
1	When pushing SET and TEST buttons at the same time for 4 seconds or more, the following display appears. If [Service check] is displayed, the mode enters in the error log mode. • [01 : Order of error log] is displayed in CODE No. window. • [Check code] is displayed. • [Indoor unit address in which an error occurred] is displayed in UNIT No. 
2	Every pushing of [▼ / ▲] button used to set temperature, the error log stored in memory is displayed in order. The numbers in CODE No. indicate CODE No. [01] (latest) to [04] (oldest). **⚠CAUTION** Do not push button because all the error log of the indoor unit will be deleted.
3	After confirmation, push TEST button to return to the usual display.

1. Check the errors according to the above procedure.
2. Ask an authorized dealer or qualified service (maintenance) professional to repair or maintain the air conditioner or the hot water module.
3. More details of the check code are explained in Service Manual.

10 Specifications

Model	Sound power level (dBA)	Weight (kg) Main unit
	Heating	
MMW-AP0271LQ-E	*	17.8
MMW-AP0561LQ-E	*	20.3

* Under 70 dBA

Hot water module operating conditions

For proper performance, operate the hot water module under the following temperature conditions:

Heating operation	Outdoor temperature	: -20°C to 19°C (Wet bulb temp.)
	Water inlet temperature	: 15°C to below 50°C
Indoor atmosphere	Indoor temperature	: 5°C to 32°C (Dry bulb temp.) : 24 or less (Wet bulb temp.)
	Indoor Relative humidity	: 30% to 85%
	Allowable dew point	: 23 or less (Wet bulb temp.)
⚠CAUTION	Be careful of installation atmosphere. It becomes a cause of failure of a product by dewing or freezing.	

If hot water module is used outside of the above conditions, safety protection may operate.

13. INSTALLATION MANUAL (EXCERPT)

3 System control of Hot Water Module

■ System able to be combined

The hot water module is connectable to only SMMS-i (Super Modular Multi system).
The system does not work when it connect to the MiNi-SMMS, SMMS (5,6 HP) and SHRM-i cannot be connected.
The Fresh Air Intake type and Air to Air Heat Exchanger with DX Coil cannot be connected with the same refrigerant system.

No.	Item					SMMS-i with Hot Water Module connection		SMMS-i without Hot Water Module connection
1	System capacity					48 HP		48 HP
2	No. of outdoor units connected					4		4
3	Indoor connection capacity				Max.	115 % (including Hot Water Module)		135 %
					Min.	65 % (excluding Hot Water Module)		50 %
4	Hot Water Module connection capacity per refrigerant system				Max.	2 units and 50 % or less		-
5	Height difference	Hight between outdoor and indoor units (including hot water module) H1	H2 > 3 m	Upper outdoor units		50 m	See Figure 1	50 m
				Lower outdoor units		30 m		30 m
			H2 ≤ 3 m	Upper outdoor units		70 m		70 m
				Lower outdoor units		40 m		40 m
		Hight between indoor units (including hot water module) H2, H4, H5	Indoor - Indoor H2	Upper outdoor units		3 m (*40)		40 m
				Lower outdoor units		10 m (*40)		
			Indoor - Hot water module H5	Upper outdoor units		3 m (*40)		-
				Lower outdoor units		10 m (*40)		-
			Hot water module - Hot water module H4	Upper outdoor units		3 m		-
				Lower outdoor units		3 m		-
		Hot Water Module - Hot Water Module				Max. 3 m		-

* When hot water module units and standard indoor units are not operated simultaneously.

▼ Capacity code of hot water module

- For the hot water module, the capacity code is decided at each model. (Table 1)

Table 1

Hot water module model	Capacity code	
	Equivalent to HP	Equivalent to capacity
MMW-AP0271LQ-E	2.5	7.1
MMW-AP0561LQ-E	5	14

The capacity code of the hot water module is different from the capacity code of the standard indoor unit.

NOTE

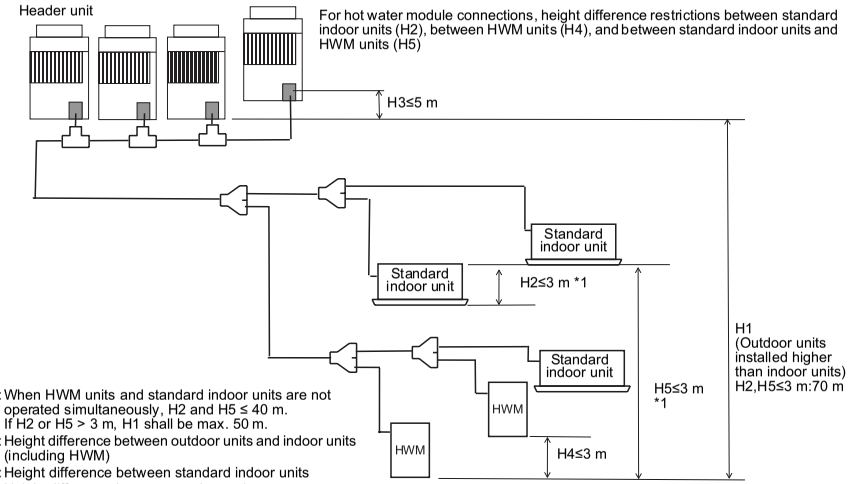
Compared with the capacity code of the outdoor unit, the total value of capacity codes of the connectable indoor units (including hot water module) differs based on the height difference between the indoor units (including hot water module).

- When the height difference between the indoor units (including hot water module) is 15 m or less: Up to 115 % (including hot water module) of the capacity code (Equivalent to HP) of the outdoor unit (Equivalent to HP) of the outdoor unit.
- When the height difference between the indoor units (including hot water module) is over 15 m: Up to 105 % (including hot water module) of the capacity code.

▼ **Figure 1**

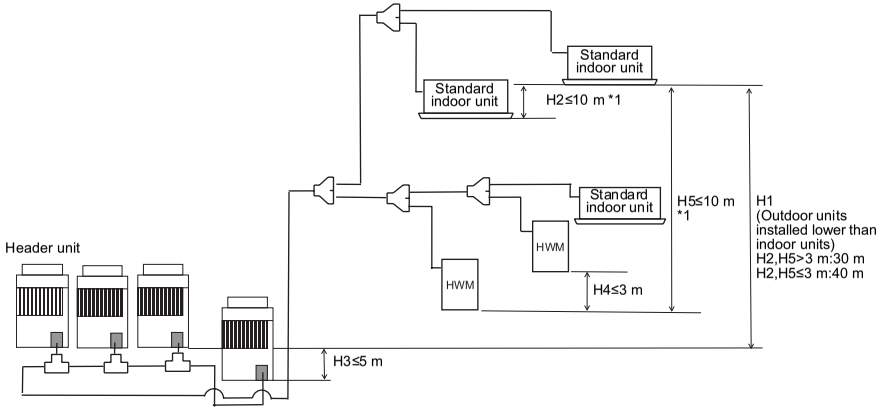
HWM : Hot Water Module

<Upper outdoor units>


Header unit
For hot water module connections, height difference restrictions between standard indoor units (H2), between HWM units (H4), and between standard indoor units and HWM units (H5)
H3≤5 m
Standard indoor unit
Standard indoor unit
H2≤3 m *1
Standard indoor unit
HWM
HWM
H4≤3 m
H5≤3 m *1
H1 (Outdoor units installed higher than indoor units) H2,H5≤3 m:70 m

*1: When HWM units and standard indoor units are not operated simultaneously, H2 and H5 ≤ 40 m. If H2 or H5 > 3 m, H1 shall be max. 50 m.
H1: Height difference between outdoor units and indoor units (including HWM)
H2: Height difference between standard indoor units
H3: Height difference between outdoor units
H4: Height difference between HWMs
H5: Height difference between standard indoor units and HWMs

<Lower outdoor units>



*1: When HWM units and standard indoor units are not operated simultaneously, H2 and H5 ≤ 40 m.
H1: Height difference between outdoor units and indoor units (including HWM)
H2: Height difference between standard indoor units
H3: Height difference between outdoor units
H4: Height difference between HWMs
H5: Height difference between standard indoor units and HWMs

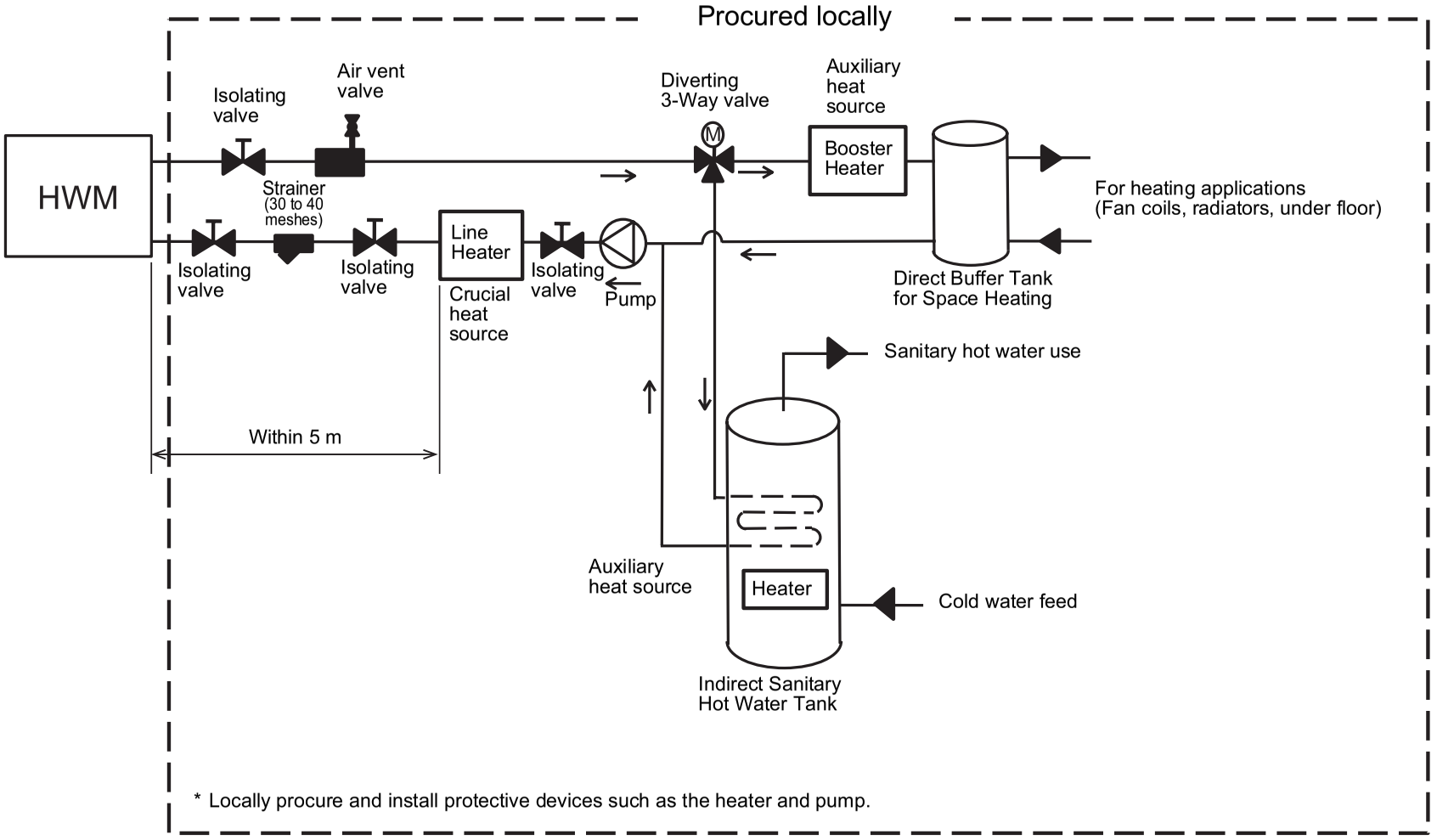
■ Example of Installation for Hot Water Module water piping

NOTE

- To install the hot water module, connect the pump and line heater.
- Do not connect more than one hot water module to one pump and one line heater.
- Be sure to install one pump and one line heater to one hot water module as shown in the following examples.

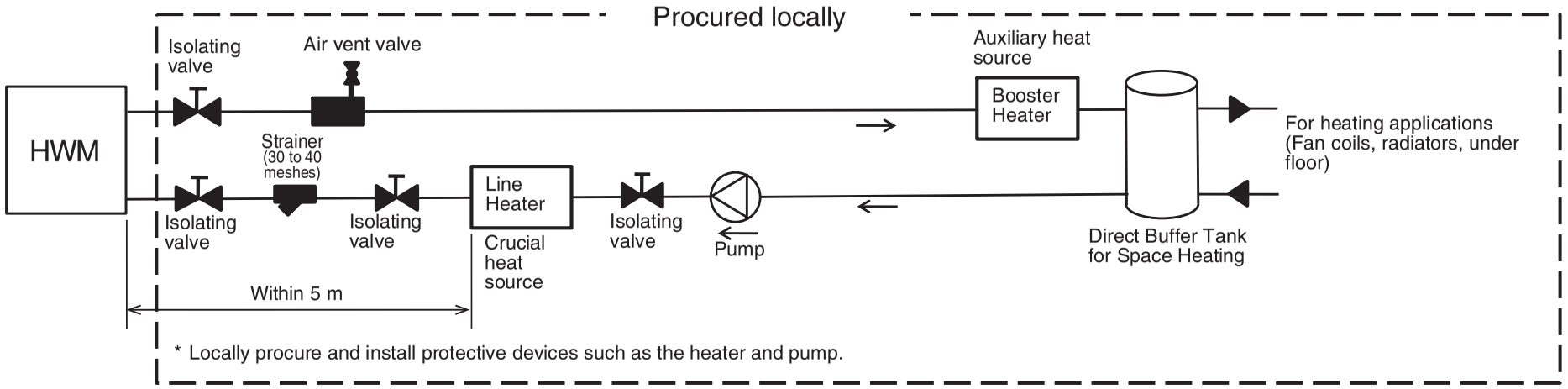
HWM : Hot Water Module

Sample 1.



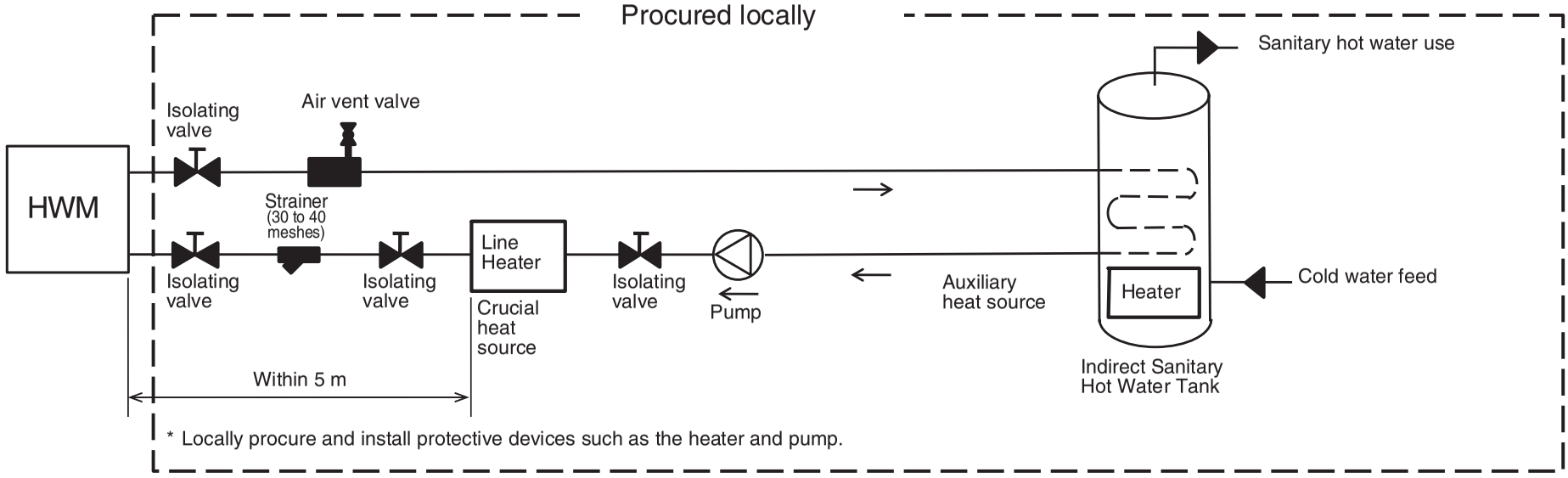
HWM : Hot Water Module

Sample 2.



HWM : Hot Water Module

Sample 3.



4 Selection of installation place

Avoid installing in the following places

Select a location for the indoor unit where the cool or warm air will circulate evenly.

Avoid installation in the following kinds of locations.

- Saline area (coastal area)
- Locations with acidic or alkaline atmospheres (such as areas with hot springs, factories where chemicals or pharmaceuticals are made and places where the exhaust air from combustion appliances will be sucked into the unit).
  Doing so may cause the heat exchanger and other parts to become corroded.
- Locations with atmospheres with mist of cutting oil or other types of machine oil.
  Doing so may cause the heat exchanger to become corroded, mists caused by the blockage of the heat exchanger to be generated, the plastic parts to be damaged, the heat insulators to peel off, and other such problems to result.
- Locations where vapors from food oils are formed (such as kitchens where food oils are used).
  The plastic parts to be damaged, and other such problems to result.
- Locations where an in-house power generator is used for the power supply.
  The power line frequency and voltage may fluctuate, and the hot water module may not work properly as a result.
- On truck cranes, ships or other moving conveyances.
- The hot water module must not be used for special applications (such as for storing food, plants, precision instruments or art works).
  (The quality of the items stored may be degraded.)
- Locations where high frequencies are generated (by inverter equipment, in-house power generators, medical equipment or communication equipment).
  (Malfunctioning or control trouble in the hot water module or noise may adversely affect the equipment's operation.)
- Locations where there is anything under the unit installed that would be compromised by wetness.
  (If the drain has become blocked or when the humidity is over 85 %, condensation from the hot water module will drip, possibly causing damage to anything underneath.)
- In the case of the wireless type of system, rooms with the inverter type of fluorescent lighting or locations exposed to direct sunlight.
  (The signals from the wireless remote controller may not be sensed.)
- Locations where organic solvents are being used.
- The hot water module cannot be used for liquefied carbonic acid cooling or in chemical plants.
- Location near doors or windows where the hot water module may come into contact with high-temperature, high-humidity outdoor air.
  (Condensation may occur as a result.)
- Locations where special sprays are used frequently.
- Places where iron or other metal dust is present. If iron or other metal dust adheres to or collects on the interior of the hot water module, it may spontaneously combust and start a fire.
- Locations such as living rooms and bedrooms where you can easily be bothered by noise. Noise may become a problem.

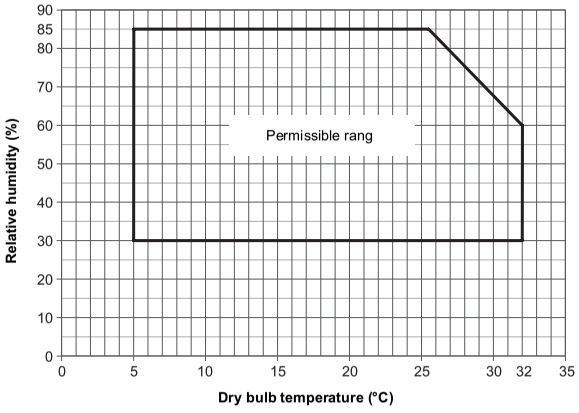
⚠ CAUTION

- Do not install hot water module in a place where water freezes.
- Do not install the hot water module in a place where combustible gas may leak.
- Do not install the hot water module in a place exposed to rain or water.
- Do not install the hot water module near equipment which generates heat.
- Do not install the hot water module to a movable object.
- Do not install the hot water module in a place exposed to vibration.
- The hot water module must be installed in accordance with national wiring regulation.
- The hot water module must not be installed in a high humidity condition area.

■ Installation atmosphere

Installation atmosphere of the unit is as follows. Be careful of installation atmosphere.
It becomes a cause of failure of a product by dewing or freezing.

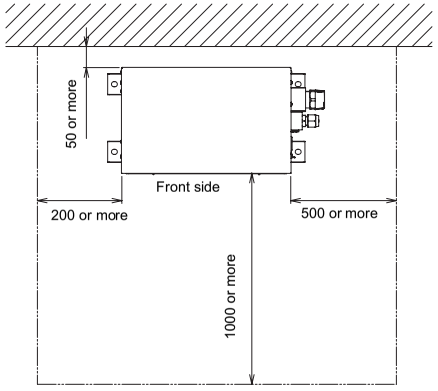
Installation atmosphere	Dry-bulb temp. (°C)	5 to 32
	Wet-bulb temp. (°C)	24 (Max.)
	RH (%)	30 to 85
	Allowable dew point (°C Wet-bulb temp)	23 or less

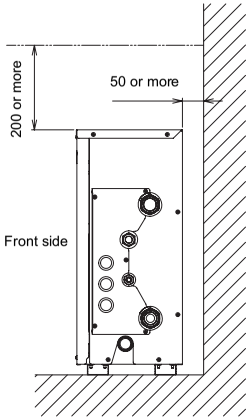


■ Installation space

(Unit: mm)

Reserve sufficient space required for installation or service work.





5 Installation

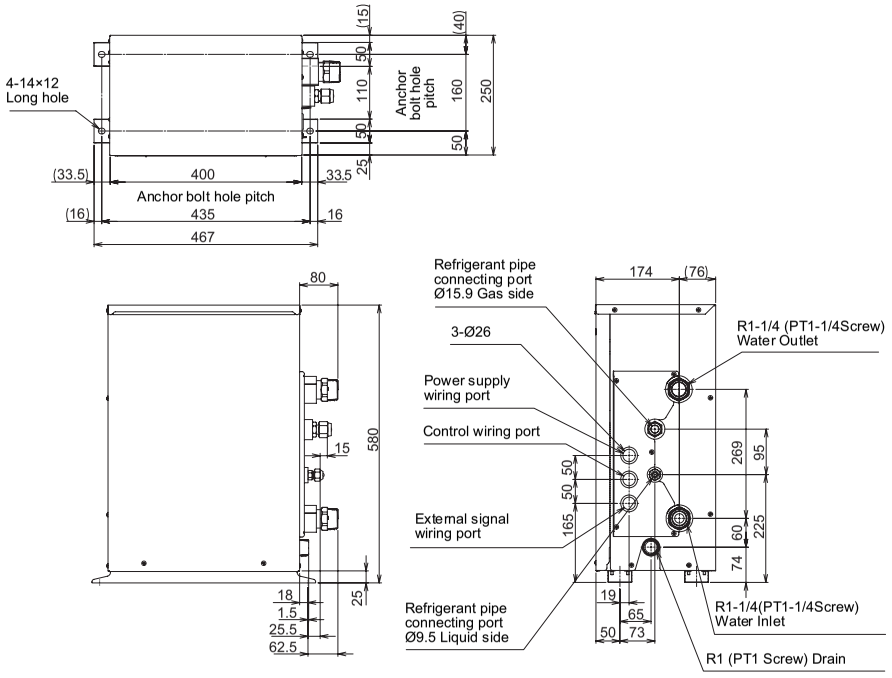
⚠ CAUTION

Strictly comply with the following rules to prevent damage of the hot water modules and human injury.

- Do not put a heavy article on the hot water module or let a person get on it. (Even units are packaged)
- Carry in the hot water module as it is packaged if possible. If carrying in the hot water module unpacked by necessity, use buffering cloth or other material to not damage the unit.
- To move the hot water module, hold the bottom face of the unit only. Do not apply force to the other parts (refrigerant pipe, drain pan, water pipe, foamed parts, resin parts or other parts).
- Carry the package by two or more persons, and do not bundle it with plastic band at positions other than specified.
- To protect yourself from injury, always use PPE (Personal Protective Equipment), that is, wear gloves.
- Install the Hot water module in a place strong enough to withstand the following weights:
  Hot water module weight with no water 17.8 kg (027) 20.3 kg (056)
  Hot water module weight with full water 18.4 kg (027) 21.6 kg (056)

■ External dimensions

(Unit: mm)



■ Fixing the hot water module to floor

⚠WARNING

- **Be sure to install the hot water module in a place able to bear its weight.**
  If strength is insufficient, the unit may fall down resulting in human injury.
- **Perform specified installation work to protect earthquakes.**
  If the hot water module is imperfectly installed, an accident by falling or dropping may be caused.

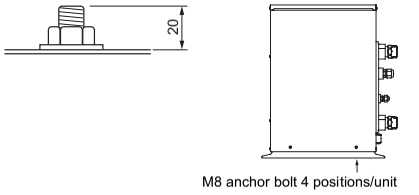
⚠CAUTION

- Drain water is discharged from the hot water module. (Especially while operating) Install the hot water module in a place with good drainage.
- For installation, be careful of the strength and level of the foundation so that abnormal sounds (vibration or noise) are not generated.

- Be sure to install the hot water module in a place strong enough to withstand its weight. If the base is unstable, reinforce with a concrete base.
- The hot water module must be anchored on a level surface. Use a level to check after installation.
- If the hot water module is installed near a room where noise is a problem, using an anti-vibration stand on the base of the unit is recommended.

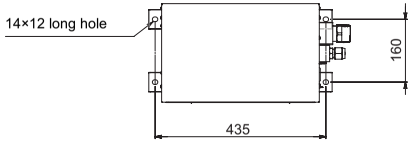
1. Fix the hot water module with M8 anchor bolts at 4 positions. 20 mm projection is appropriate for an anchor bolt.

(Unit: mm)



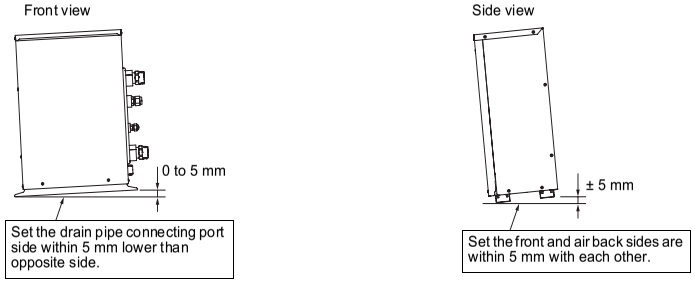
- Anchor bolt positions are as shown below:

(Unit: mm)



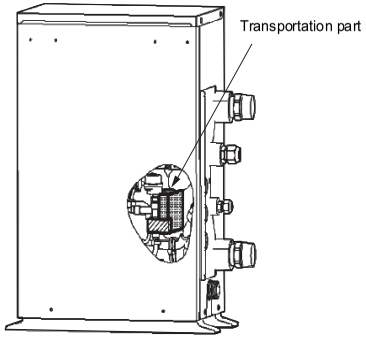
REQUIREMENT

- Fix the unit in a horizontal position.
  When unit is fixed to slant, it may cause overflow of drainage.
- Install the unit within the dimension according to the figure below.
- Use level gauge or vinyl hose to confirm whether the unit is fix horizontally.


Front view
0 to 5 mm
Set the drain pipe connecting port side within 5 mm lower than opposite side.
Side view
± 5 mm
Set the front and air back sides are within 5 mm with each other.

■ Remove the part for transportation

Be sure to remove the transportation part before operating the unit.



6 Water piping

⚠WARNING

- Install water pipes according to the regulations of respective countries.
- Install water pipes in the freeze-free place.
- Make sure that water pipes have sufficient pressure resistance. The design pressure is 1.0 MPa.

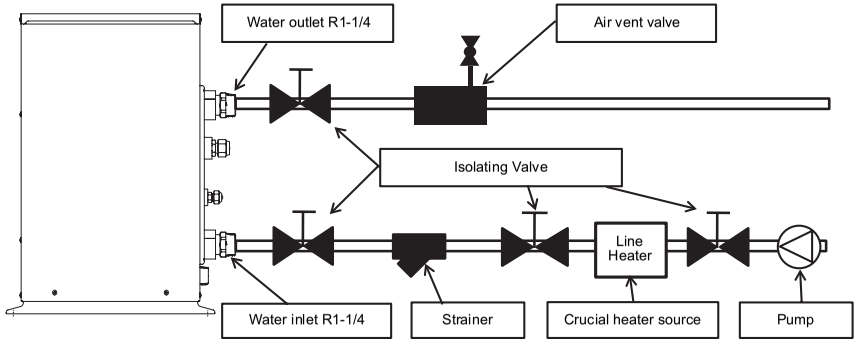
⚠CAUTION

- Do not use zinc plated water pipes. When steel pipes are used, insulate both ends of the pipes.
- Copper pipes are recommended.
- The water to be used must meet the water quality standard specified in EN directive 98/83 EC.

■Water piping and line heater installation

- Make the piping route a closed circuit. (An open water circuit may cause a failure.)
- Before a long period of none use, purge the water out of the pipes and thoroughly let them dry. Do not add brine to the circulating water.
- Do not use the water used for the unit for drinking or food manufacturing.
- To insure easy maintenance, inspection, and replacement of the unit, use a proper joint, valve, etc (procured locally) on the water inlet and outlet port.
- Be sure to install a strainer with 30 to 40 meshes (procured locally) on the water inlet pipe. If a strainer is not installed, this may cause impaired performance, or damage to the plate heat exchanger from freezing.
- Install a suitable air vent (procured locally) on the water pipe. After sending water through the pipe, be sure to vent the excess air.
- To avoid water leak, wrap some sealing tape around the screw part.
- Water pipes can get very hot, depending on the preset temperature. Wrap the water pipes with heat insulation (procured locally) to prevent burns.
- Be sure to install the line heater (procured locally) on the water inlet side. In addition, position it within 5 m of the water inlet pipe of the hot water module.
- Follow the table below to select a line heater (procured locally) within the range of 40 to 50 % of the hot water module's rated capacity.

Hot water module model name	Capacity of line heater (kW)
MMW-AP0271LQ-E	3.2~4.0
MMW-AP0561LQ-E	6.4~8.0



■Pipe size, material and insulator

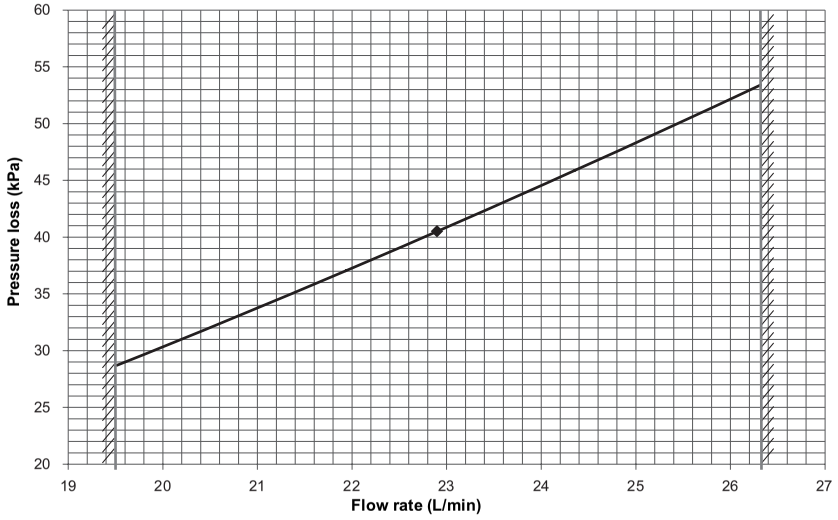
The following specification for piping work and insulating process are procured locally.

Model		MMW-	AP027	AP056
Connecting pipe (unit side)	Water pipe	Inlet	R1-1/4	
		Outlet	R1-1/4	
Connecting pipes material			Copper pipes are recommended	
Insulator			Formed polyethylene foam, thickness: 10 mm or more	

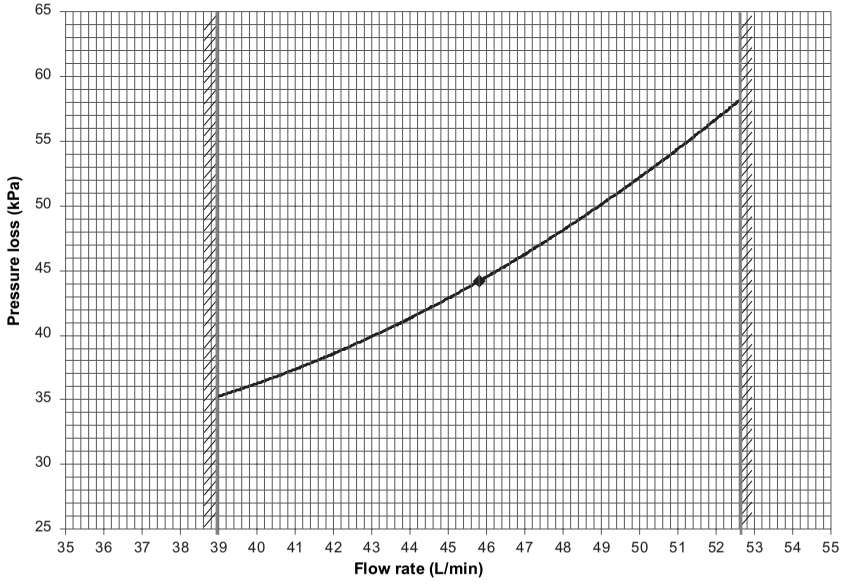
■ Characteristics of hot water module flow rate and pressure loss

The following graph shows the range of flow rates used for the hot water module, and the characteristic pressure losses. Use this as an aid in the local pump procurement process.

027type	Min.	Rated	Max.
Water flow rate (L/min)	19.5	22.9	26.3
Pressure loss (kPa)	28.5	40.5	53.5



056type	Min.	Rated	Max.
Water flow rate (L/min)	38.9	45.8	52.6
Pressure loss (kPa)	35.2	44.2	58.2

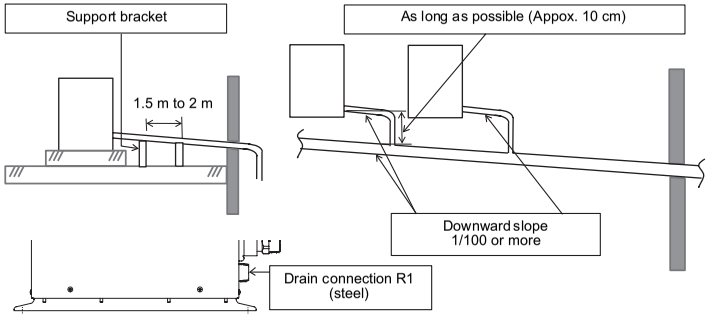


7 Drain piping

⚠CAUTION

- **Following the Installation Manual, perform the drain piping work so that water is properly drained. Apply a heat insulation so as not to cause a dew condensation.**
  Inappropriate piping work may result in water leakage in the room and wet furniture.
- **After opening the knockout hole, deburr the edge.**
  Burrs adhered to opening of the knockout hole may causes an injury by touching it.

Drain piping



- Provide the indoor drain piping with proper heat insulation.
- Provide the area where the pipe connects to the indoor unit with proper heat insulation. Improper heat insulation will cause condensation to form.
- The drain pipe must be sloping downward (at an angle of 1/100 or more), and do not run the pipe up and down (arched shape) or allow it to form traps. Doing so may cause abnormal sounds.
- Restrict the length of the traversing drain pipe to 20 meters or less. For a long pipe, provide support brackets at intervals of 1.5 to 2 meters to prevent flapping.
- Install the collective piping as shown in the following figure.
- Do not provide any air vents. Otherwise, the drain water will spout, causing water to leak.
- Do not allow any force to be applied to the connection area with the drain pipe.
- To avoid water leak, wrap some sealing tape around the screw part.
- Drain connection is made from steel. Do not connect the joint pipe made from stainless steel.

■ Pipe material, size and insulator

The following materials for piping work and insulating process are procured locally.

Pipe material	Hard vinyl chloride pipe, VP25A (Nominal outer diameter 32 mm)
Insulator	Foamed polyethylene foam, thickness: 10 mm or more

■ Connecting drain pipe

Wrap some sealing tape around the screw part to avoid water leak.

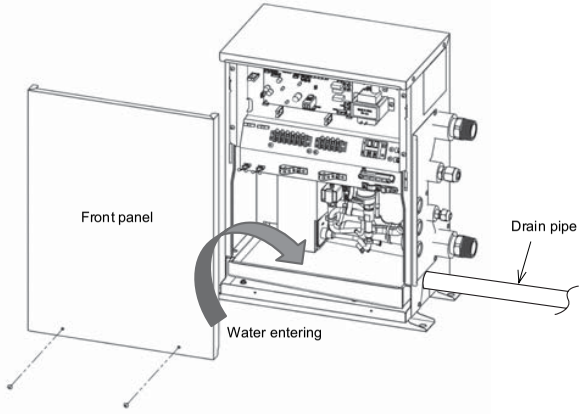
REQUIREMENT

- Connect the hard vinyl chloride pipes certainly so that water does not leak by using adhesive agent for vinyl chloride.
- It takes some time to dry and indurate the adhesive agent. (Refer to the manual of adhesive agent.) Do not apply any extra force on the connecting section until the adhesive agent dried.

■ Check the draining

In the test run, check that water drain is properly performed and water does not leak from the connecting part of the pipes. Check draining also when installed in heating period.

Check the water drainage is surely performed at the trial operation.
Check also no water leakage is found at the pipe connecting part.



REQUIREMENT

Enter water gradually using a kettle or a hose from drain pan of the discharge port.

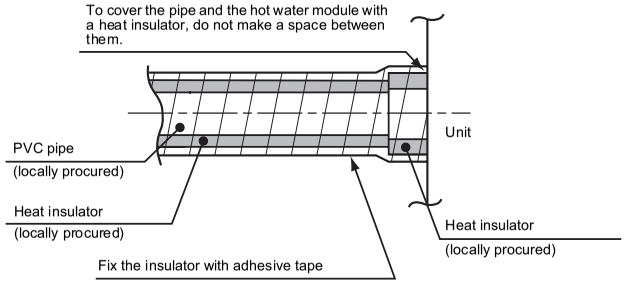
⚠CAUTION

Pour water slowly.

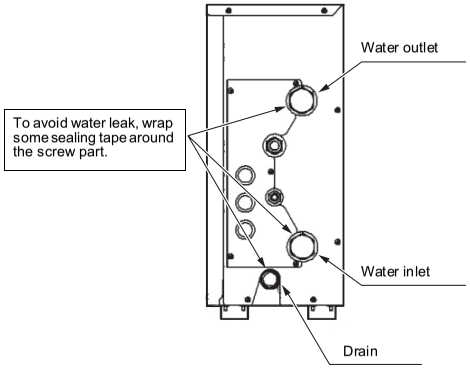
If it is poured urgently, water is spread inside of the indoor unit resulted in a trouble.

■ Heat insulating process

• After drain check, covering the heat insulator for drain connecting section, wrap the drain pipe with heat insulator (Locally procured) without clearance from the end of the drain pipe connecting port of the hot water module.


To cover the pipe and the hot water module with a heat insulator, do not make a space between them.
Unit
PVC pipe
(locally procured)
Heat insulator
(locally procured)
Heat insulator
(locally procured)
Fix the insulator with adhesive tape

■ Check the following contents



8 Refrigerant piping

⚠ CAUTION

When the refrigerant pipe is long, provide support brackets at intervals of 2.5 m to 3 m to clamp the refrigerant pipe. Otherwise, abnormal sound may be generated.

Use the flare nut attached with the indoor unit or R410A flare nut.

■ Permissible piping length and height difference

They vary depending on the outdoor unit. For details, refer to the Installation Manual attached to the outdoor unit, and this manual (Refer to "3. System control of Hot Water Module").

■ Pipe size

Model MMW-	Pipe size (mm)	
	Gas side	Liquid side
AP027 to AP056	Ø15.9	Ø9.5

■ Connecting refrigerant piping

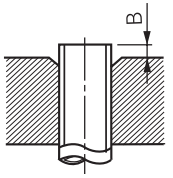
Flaring

1 Cut the pipe with a pipe cutter.
Remove burrs completely. (Remaining burrs may cause gas leakage.)

2 Insert a flare nut into the pipe, and flare the pipe.
Use the flare nut provided with the unit or the one used for the R410A refrigerant. The flaring dimensions for R410A are different from the ones used for the conventional R22 refrigerant. A new flare tool manufactured for use with the R410A refrigerant is recommended, but the conventional tool can still be used if the projection margin of the copper pipe is adjusted to be as shown in the following table.

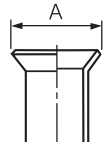
Projection margin in flaring: B (Unit: mm)

Outer dia. of copper pipe	R410A tool used	Conventional tool used
6.4, 9.5	0 to 0.5	1.0 to 1.5
12.7, 15.9		



Flaring diameter size: A (Unit: mm)

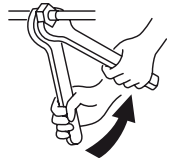
Outer dia. of copper pipe	$A^{+0}_{-0.4}$
6.4	9.1
9.5	13.2
12.7	16.6
15.9	19.7



* In case of flaring for R410A with the conventional flare tool, pull it out approx. 0.5 mm more than that for R22 to adjust to the specified flare size. The copper pipe gauge is useful for adjusting projection margin size.

• The sealed gas was sealed at the atmospheric pressure so when the flare nut is removed, there will no “whooshing” sound: This is normal and is not indicative of trouble.

• Use two wrenches to connect the indoor unit pipe.



Work using double spanner

- Use the tightening torque levels as listed in the table below.

Outer dia. of connecting pipe (mm)	Tightening torque (N•m)
6.4	14 to 18 (1.4 to 1.8 kgf•m)
9.5	33 to 42 (3.3 to 4.2 kgf•m)
12.7	50 to 62 (5.0 to 6.2 kgf•m)
15.9	63 to 77 (6.3 to 7.7 kgf•m)

- Tightening torque of flare pipe connections. Pressure of R410A is higher than that of R22. (Approx. 1.6 times) Therefore, using a torque wrench, tighten the flare pipe connecting sections which connect the indoor and outdoor units of the specified tightening torque. Incorrect connections may cause not only a gas leak, but also a trouble of the refrigeration cycle.

⚠CAUTION

Tightening with an excessive torque may crack the nut depending on installation conditions.

■Airtight test / air purge, etc.

For air tightness test, adding refrigerant, refer to the Installation Manual attached to the outdoor unit.

⚠CAUTION

Do not supply power to the indoor unit and the hot water module until the airtight test and vacuuming are completed. (If the indoor unit or the hot water module is powered on, the pulse motor valve is fully closed, which extends the time for vacuuming.)

■Open the valve fully

Open the valve of the outdoor unit fully.

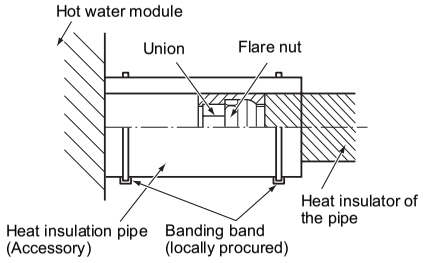
■Heat insulation process

Apply heat insulation for the pipes separately at liquid side and gas side.

- For the heat insulation to the pipes at gas side, use the material with heat-resisting temperature 120 °C or higher.
- To use the attached heat insulation pipe, apply the heat insulation to the pipe connecting section of the hot water module securely without gap.

REQUIREMENT

- Apply the heat insulation to the pipe connecting section of the hot water module securely up to the root without exposure of the pipe. (The pipe exposed to the outside causes water leak.)
- Wrap heat insulator with its slits facing up (ceiling side).



■Installation of remote controller (Sold separately)

For installation of the wired remote controller, follow the Installation Manual attached with the remote controller.

- Pull out the remote controller cord together with the refrigerant pipe or drain pipe. Pass the remote controller cord through upper side of the refrigerant pipe and drain pipe.
- Do not leave the remote controller at a place exposed to the direct sunlight and near a stove.

9 Electrical connection

⚠WARNING

- **Use the specified wires for wiring connect the terminals. Securely fix them to prevent external forces applied to the terminals from affecting the terminals.**
  Incomplete connection or fixation may cause a fire or other trouble.
- **Connect earth wire. (grounding work)**
  Incomplete grounding cause an electric shock.
  Do not connect earth wires to gas pipes, water pipes, lightning conductor or telephone earth wires.
- **Appliance shall be installed in accordance with national wiring regulations.**
  Capacity shortage of power circuit or incomplete installation may cause an electric shock or a fire.

⚠CAUTION

- If incorrect / incomplete wiring is carried out, it will cause an electrical fire or smoke.
- Install an earth leakage breaker that is not tripped by shock waves.
  If an earth leakage breaker is not installed, an electric shock may be caused.
- Use the cord clamps attached to the product.
- Do not damage or scratch the conductive core and inner insulator of power and inter-connecting wires when peeling them.
- Use the power cord and Inter-connecting wire of specified thickness, type, and protective devices required.
- Do not connect 220 V – 240 V power to the terminal blocks (Ⓤ, Ⓤ, Ⓐ, Ⓑ) for control wiring and the terminal blocks (COM, S1, S2, S3, S4, S5) for output function. (Otherwise, the system will fail.)
- Do not damage or scratch the conductive core and inner insulator of power and inter-connecting wires when peeling them.
- Perform the electric wiring so that it does not come to contact with the high-temperature part of the pipe.
  The coating may melt resulting in an accident.

REQUIREMENT

- For power supply wiring, strictly conform to the Local Regulation in each country.
- For wiring of power supply of the outdoor units, follow the Installation Manual of each outdoor unit.
- Perform the electric wiring so that it does not come to contact with the high-temperature part of the pipe.The coating may melt resulting in an accident.
- After connecting wires to the terminal blocks, provide a trap and fix wires with the cord clamp.
- Run the refrigerant piping line and control wiring line in the same line.
- Do not turn on the power of the hot water module until vacuuming of the refrigerant pipes completes.

■ Power supply wire and communication wires specifications

Power supply wire and communication wires are procured locally.

For the power supply specifications, follow to the table below. If capacity is little, it is dangerous because overheat or burnout may be caused.

For specifications of the power capacity of the outdoor unit and the power supply wires, refer to the Installation Manual attached to the outdoor unit.

Hot water module power supply

- For the power supply of the hot water module, prepare the exclusive power supply separated from that of the outdoor unit.
- Arrange the power supply, circuit breaker, and main switch of the hot water module connected to the same outdoor unit so that they are commonly used.
- Power supply wire specification: Cable 3-core 2.5 mm², **in conformity with Design 60245 IEC 57**.

▼ Power supply

Power supply	220 V – 240 V ~, 50 Hz	
Power supply switch / circuit breaker or power supply wiring / fuse rating for hot water module should be selected by the accumulated total current values of the hot water module.		
Power supply wiring	Below 50 m	2.5 mm²

Control wiring, Central controller wiring

- 2-core with polarity wires are used for the Control wiring between indoor unit (including hot water module) and outdoor unit and Central controller wiring.
- To prevent noise trouble, use 2-core shield wire.
- The length of the communication line means the total length of the inter-unit wire length between indoor (including hot water module) and outdoor units added with the central control system wire length.

▼ Communication line

Control wiring between indoor units (including hot water module), and outdoor unit (2-core shield wire)	Wire size	(Up to 1000 m) 1.25 mm² (Up to 2000 m) 2.0 mm²
Central control line wiring (2-core shield wire)		

Remote controller wiring

- 2-core with non-polarity wire is used for wiring of the remote controller wiring and group remote controllers wiring.

Remote controller wiring, remote controller inter-unit wiring	Wire size: 0.5 mm² to 2.0 mm²	
Total wire length of remote controller wiring and remote controller inter-unit wiring = L + L1 + L2 + … Ln	In case of wired type only	Up to 500 m
	In case of wireless type included	Up to 400 m
Total wire length of remote controller inter-unit wiring = L1 + L2 + … Ln		Up to 200 m

Output signal function wiring

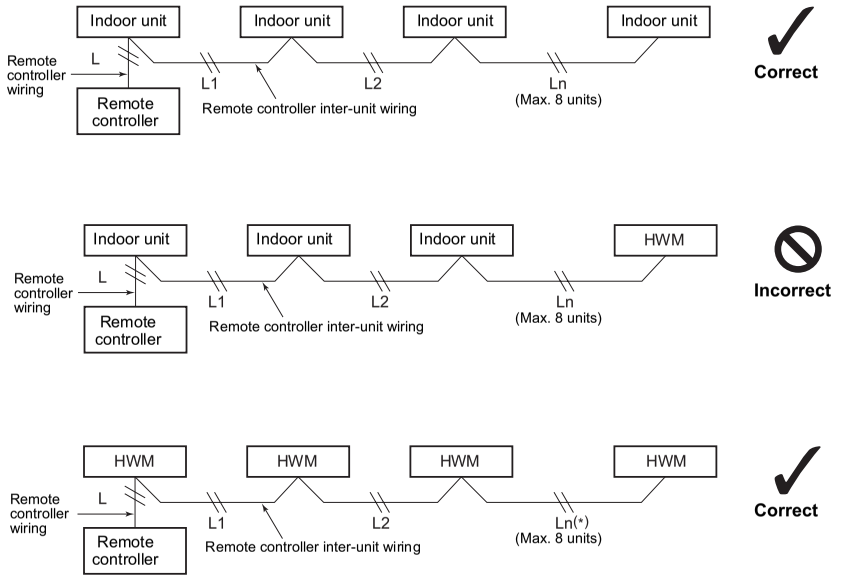
- To prevent noise trouble, use 2-core shield wire.

Output function wiring (2-core shield wire)	Wire size	(up to 2 m) 0.5 mm²

⚠ CAUTION

The remote controller wire (Communication line) and AC 220 – 240 V wires cannot be parallel to contact each other and cannot be stored in the same conduits. If doing so, a trouble may be caused on the control system due to noise or other factor.

HWM : Hot Water Module



(*) : In the case of multiple refrigerant systems

NOTE

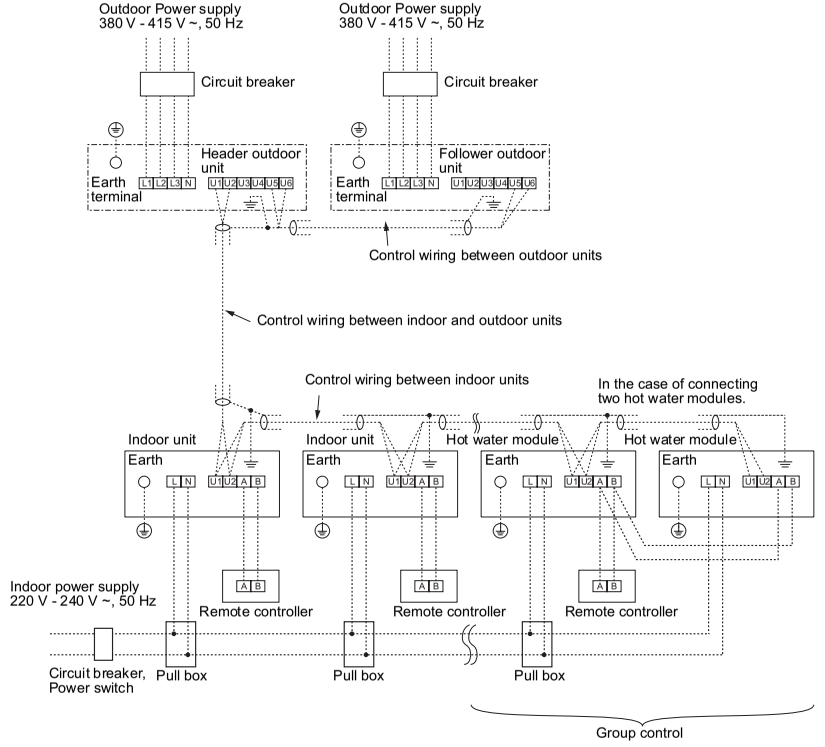
It is not possible to connect any Hot Water Modules and any indoor units together for group control.

■ Wiring between indoor (including hot water module) and outdoor units

NOTE

- An outdoor unit connected with control wiring between indoor (including hot water module) and outdoor units wire becomes automatically the header unit.
- Do not turn off the circuit breaker of the hot water module when the circuit breaker of the system (outdoor unit) is set to the ON position.
- It becomes a cause of a trouble.

▼Wiring example

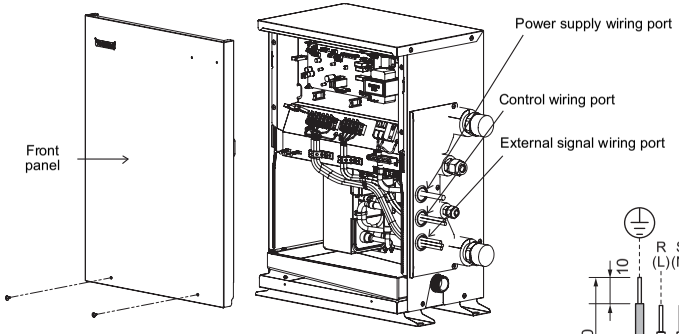


■ Wire connection

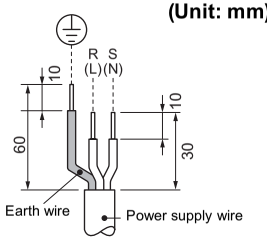
REQUIREMENT

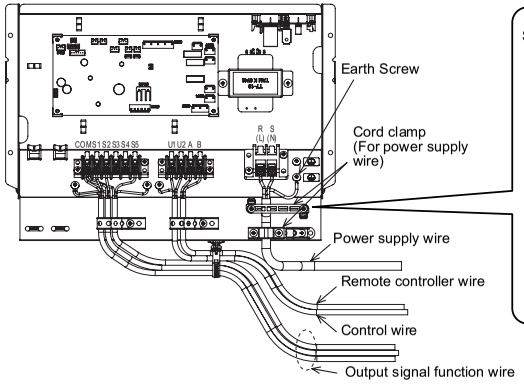
- Connect the wires matching the terminal numbers. Incorrect connection causes a trouble.
- Pass the wires through the bushing of wire connection holes of the hot water module.
- Keep a margin (Approx. 100 mm) on a wire to hang down the electrical control box at servicing or other purpose.
- The low-voltage circuit is provided for the remote controller. (Do not connect the high-voltage circuit)

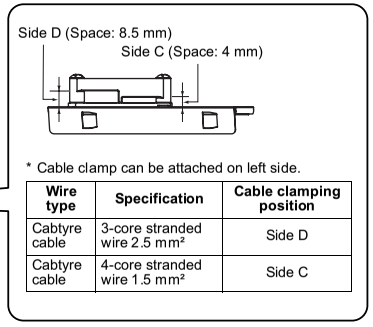
- Remove the front panel of the hot water module by taking off the mounting screws (2 positions).
- Tighten the screws of the terminal block, and fix the wires with cord clamp attached to the electrical control box. (Do not apply tension to the connecting section of the terminal block.)
- Mount the front panel of the hot water module without pinching wires.



(Unit: mm)







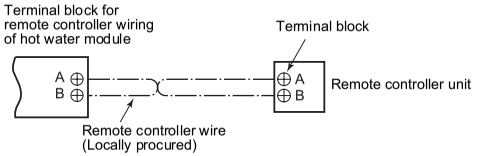
* Cable clamp can be attached on left side.

Wire type	Specification	Cable clamping position
Cabtyre cable	3-core stranded wire 2.5 mm²	Side D
Cabtyre cable	4-core stranded wire 1.5 mm²	Side C

■ Remote controller wiring

- Strip off approx. 9 mm the wire to be connected.

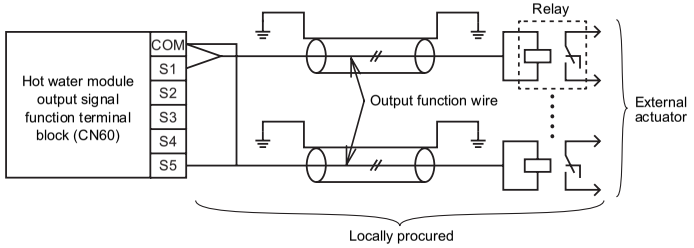
▼Wiring diagram



■ Output signal function wiring

Connect the following output signals from the hot water module.

Terminal block No.	Function	Comments
COM	DC12V (COM)	Common for connector S2 ~ S5
S1	Defrosting output (COM-S1)	DC12V Relay coil is less than 16mA.
S2	Line heater output (COM-S2)	DC12V Relay coil is less than 16mA.
S3	-	-
S4	Heating thermostat ON output (COM-S4)	DC12V Relay coil is less than 16mA.
S5	Pump output (COM-S5)	DC12V Relay coil is less than 16mA.



NOTE

Auxiliary relays (locally procured) must be connected to output signal function wirings to allow connection to the hot water module output signal functions. The maximum current output signal, from each of the output signal function wirings, is 16 mA. Please ensure the rated current of the relay coil is less than 16 mA to avoid damage to the hot water module P.C. board.

▼Output function wire

⚠CAUTION

Output signal functions are separated from primary basic insulation.

- To prevent noise trouble, use 2-core shield wire.
- Determine the wire length between the hot water module output signal function terminal block and the relay up to 2 m.
- Locally procure and install protective devices such as the heater and pump.

■Address setup

Set up the addresses as per the Installation Manual supplied with the outdoor unit.

10 Applicable controls

REQUIREMENT

When the hot water module is used for the first time, it will take some moments after the power has been turned on before the remote controller becomes available for operations: This is normal and is not indicative of trouble.

- Concerning the automatic addresses (The automatic addresses are set up by performing operations on the outdoor interface circuit board.)
  While the automatic addresses are being set up, no remote controller operations can be performed.
  Setup takes up to 10 minutes (usually about 5 minutes).
- When the power is turned on after automatic address setup
  It takes up to 10 minutes (usually about 3 minutes) for the outdoor unit to start operating after the power has been turned on.

Before the hot water module was shipped from the factory, all units are set to [STANDARD] (factory default). If necessary, change the indoor unit (including hot water module) settings. The settings are changed by operating the wired remote controller.

* The settings cannot be changed using only a wireless remote controller, simple remote controller or group control remote controller by itself so install a wired remote controller separately as well.

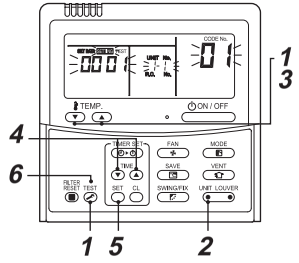
■Basic procedure for changing settings

Change the settings while the hot water module is not working. **(Stop the hot water module before making settings.)**

⚠CAUTION

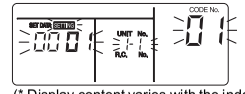
Set only the CODE No. shown in the following table: Do NOT set any other CODE No.

If a CODE No. not listed is set, it may not be possible to operate the hot water module or other trouble with the product may result.



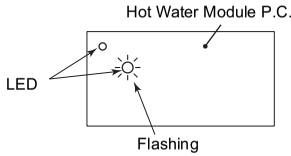
1 Push and hold TEST button and "TEMP." ▼ button simultaneously for at least 4 seconds. After a while, the display flashes as shown in the figure. Confirm that the CODE No. is [01].

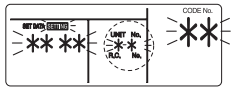
- If the CODE No. is not [01], push TEST button to clear the display content, and repeat the procedure from the beginning. (No operation of the remote controller is accepted for a while after TEST button is pushed.)
  (While hot water modules are operated under the group control, "ALL" is displayed first. When UNIT. LOUVER is pushed, the indoor unit number displayed following "ALL" is the header unit.)



(* Display content varies with the indoor unit (including hot water module) model.)

2 **Each time UNIT. LOUVER button is pushed, hot water module numbers in the control group change cyclically. Select the hot water module to change settings for.**
The LED on the P.C. board of the selected hot water module flashes. The hot water module for change settings can be confirmed.





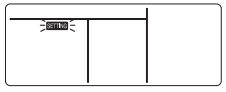
3 **Specify CODE No. [✱✱] with "TEMP." ▼ / ▲ buttons.**

4 **Select SET DATA [✱✱✱✱] with "TIME" ▼ / ▲ buttons.**

5 **Push SET button. When the display changes from flashing to lit, the setup is completed.**
- To change settings of another hot water module, repeat from Procedure **2**.
- To change other settings of the selected hot water module, repeat from Procedure **3**.

Use SET button to clear the settings. To make settings after SET button was pushed, repeat from Procedure **2**.

6 **When settings have been completed, push TEST button to determine the settings.**
When TEST button is pushed, SETTING flashes and then the display content disappears and the hot water module enters the normal stop mode.
(While SETTING is flashing, no operation of the remote controller is accepted.)



■ Group control

In a group control, a remote controller can control up to maximum 8 units.
- The wired remote controller only can control a group control. The wireless remote controller is unavailable for this control.
- For wiring procedure and wires of the individual line (Identical refrigerant line) system, refer to "Electrical Connection" in this Manual.
- Wiring between indoor units in a group is performed in the following procedure.
- Connect the hot water modules by connecting the remote controller wires from the remote controller terminal blocks (A, B) of the hot water module connected with a remote controller to the remote controller terminal blocks (A, B) of the other hot water modules. (Non-polarity)
- For address setup, refer to the Installation Manual attached to the outdoor unit.

■ Remote controller sensor

⚠CAUTION

Remote controller sensor can not be used for the hot water module. Remote controller sensor has no function when remote controller is connected to the hot water module.

11 Test run

■ Before test run

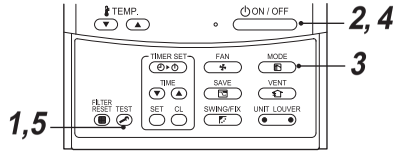
- Before turning on the power supply, carry out the following procedure.
  1) By using 500 V-megger, check that resistance of 1 MΩ or more exists between the terminal block L to N and the earth (grounding).
     If resistance of less than 1 MΩ is detected, do not run the unit.
  2) Check the valve of the outdoor unit being opened fully.
- To protect the compressor at activation time, leave power-ON for 12 hours or more before operating.
- Do not press the electromagnetic contactor to forcibly perform a test run. (This is very dangerous because the protective device does not work.)
- Before starting a test run, set addresses by following the Installation Manual supplied with the outdoor unit.

■ Execute a test run

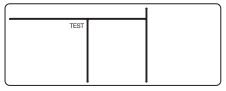
Operate the unit with the wired remote controller as usual.
For the procedure of the operation, refer to the attached Owner's Manual to the outdoor unit.
A forced test run can be executed in the following procedure even if the operation stops by thermostat-OFF.
In order to prevent a serial operation, the forced test run is released after 60 minutes have passed and returns to the usual operation.

⚠CAUTION

Do not use the forced test run for cases other than the test run because it applies an excessive load to the devices.

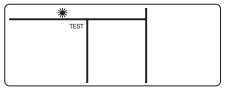


1 **Push TEST button for 4 seconds or more. [TEST] is displayed on the display part and the selection of mode in the test mode is permitted.**



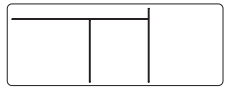
2 **Push ON / OFF button.**

3 **Select the operation mode with MODE button, [☀Heat].**
- Can not select the hot water module in a mode other than [☀Heat].
- The temperature controlling function does not work during test run.
- The detection of error is performed as usual.



4 **After the test run, push ON / OFF button to stop a test run.**
(Display part is same as procedure **1**.)

5 **Push TEST check button to cancel (release from) the test run mode.**
([TEST] disappears on the display and the status returns to a normal.)



12 Maintenance

▼Periodic Maintenance

- For environmental conservation, it is strongly recommended that the indoor and outdoor units of the air conditioner (including hot water module) in use be cleaned and maintained regularly to ensure efficient operation of the air conditioner.
  When the air conditioner (including hot water module) is operated for a long time, periodic maintenance (once a year) is recommended.
  Furthermore, regularly check the outdoor unit for rust and scratches, and remove them or apply rustproof treatment, if necessary.
  As a general rule, when an indoor unit is operated for 8 hours or more daily, clean the indoor unit and outdoor unit at least once every 3 months. Ask a professional for this cleaning / maintenance work.
  Such maintenance can extend the life of the product though it involves the owner's expense.
  Failure to clean the indoor and outdoor units regularly will result in poor performance, freezing, water leakage, and even compressor failure.

Inspection before maintenance

Following inspection must be carried out by a qualified installer or qualified service person.

Parts	Inspection method
Drain pan	Access from inspection opening and remove the front panel. Check if there is any clogging or drain water is polluted.

▼Maintenance List

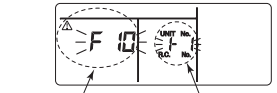
Part	Unit	Check (visual / auditory)	Maintenance
Heat exchanger	Outdoor	Dust / dirt clogging, scratches	Wash the heat exchanger when it is clogged.
Fan motor	Outdoor	Sound	Take appropriate measures when abnormal sound is generated.
Air inlet / outlet grilles	Outdoor	Dust / dirt, scratches	Fix or replace them when they are deformed or damaged.
Drain pan	Hot water module	Dust / dirt clogging, drain contamination	Clean the drain pan and check the downward slope for smooth drainage.
Exterior	Hot water module / Outdoor	• Rust, peeling of insulator • Peeling / lift of coat	Apply repair coating.
Water pipes	Hot water module	Rust, leakage Evidence of leakage	Checking
Strainer	Hot water module	Dust / dirt clogging	Checking

It recommends that a pump and a strainer are maintained periodically.

13 Troubleshooting

■ Confirmation and check

When an error occurred in the hot water module, an error code and indoor UNIT No. (including hot water module) appear on the display part of the remote controller.
The error code is only displayed during the operation. If the display disappears, operate the hot water module according to the following "Confirmation of error log" for confirmation.

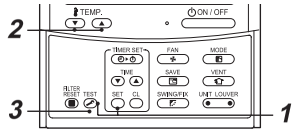


Error code

Indoor UNIT No. (including hot water module) in which an error occurred

■ Confirmation of error log

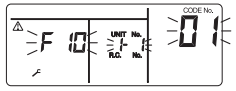
When an error occurred on the hot water module, the error log can be confirmed with the following procedure. (The error log is stored in memory up to 4 errors.)
The log can be confirmed from both operating status and stop status.



1

When SET and TEST buttons are pushed simultaneously for 4 seconds or more, the following display appears. If 🔧 is displayed, the mode enters in the error log mode.

- [**01**: Order of error log] is displayed in CODE No..
- [Error code] is displayed in CHECK.
- [Indoor unit address in which an error occurred] is displayed in Unit No..



2

Every pushing of TEMP. button used to set temperature, the error log stored in memory is displayed in order.
The numbers in CODE No. indicate CODE No. [**01**] (latest) → [**04**] (oldest).

REQUIREMENT

Do not push CL button because all the error log of the indoor unit (including hot water module) will be deleted.

3

After confirmation, push TEST button to return to the usual display.

Check method

On the wired remote controller, central control remote controller and the interface P.C. board of the outdoor unit (I/F), a check display LCD (Remote controller) or 7-segment display (on the outdoor interface P.C. board) to display the operation is provided. Therefore the operation status can be known. Using this self-diagnosis function, a trouble or position with error of the air conditioner (including hot water module) can be found as shown in the table below.

Check code list

The following list shows each check code. Find the check contents from the list according to part to be checked.

- In case of check from indoor remote controller: See “Wired remote controller display” in the list.
- In case of check from outdoor unit: See “Outdoor unit 7-segment display” in the list.

Indoor unit : Including hot water module
IPDU: Intelligent Power Drive Unit

Check code			Check code name	Judging device
Wired remote controller display	Outdoor unit 7-segment display			
		Auxiliary code		
E01	—	—	Communication error between indoor unit and remote controller (Detected at remote controller side)	Remote controller
E02	—	—	Remote controller transmission error	Remote controller
E03	—	—	Communication error between indoor unit and remote controller (Detected at indoor unit side)	Indoor unit
E04	—	—	Communication circuit error between indoor / outdoor unit (Detected at indoor unit side)	Indoor unit
E06	E06	No. of indoor units in which sensor has been normally received	Decrease of No. of indoor units	I/F
—	E07	—	Communication circuit error between indoor / outdoor unit (Detected at outdoor unit side)	I/F
E08	E08	Duplicated indoor unit addresses	Duplicated indoor unit addresses	Indoor unit • I/F
E09	—	—	Duplicated master remote controllers	Remote controller
E10	—	—	Communication error between indoor unit MC	Indoor unit
E12	E12	01:Indoor / Outdoor units communication 02:Outdoor / Outdoor units communication	Automatic address start error	I/F
E15	E15	—	No indoor unit during automatic addressing	I/F
E16	E16	00:Capacity over 01 ~:No. of connected units	Capacity over / No. of connected indoor units	I/F
E18	—	—	Communication error between header and follower units Indoor unit	Indoor unit
E19	E19	00:No header 02:Two or more header units	Outdoor header units quantity error	I/F
E20	E20	01:Outdoor unit of other line connected 02:Indoor unit of other line connected	Other line connected during automatic address	I/F
E21	E21	02:No header unit 00:Multiple number of header units	Error in number of heat storage master units	I/F
E22	E22	—	Reduction in number of heat storage units	I/F
E23	E23	—	Sending error in communication between outdoor units Error in number of heat storage units (trouble with reception)	I/F
E25	E25	—	Duplicated follower outdoor addresses	I/F
E26	E26	No. of outdoor units which received signal normally	Decrease of No. of connected outdoor units	I/F
E28	E28	Detected outdoor unit number	Follower outdoor unit error	I/F
E31	E31	Number of IPDU (*1)	IPDU communication error	I/F
F01	—	—	Indoor unit TCJ sensor error	Indoor unit
F03	—	—	Indoor unit TC1 sensor error	Indoor unit
F04	F04	—	TD1 sensor error	I/F
F05	F05	—	TD2 sensor error	I/F
F06	F06	01:TE1 sensor 02:TE2 sensor	TE1 sensor error TE2 sensor error	I/F
F07	F07	—	TL sensor error	I/F
F08	F08	—	TO sensor error	I/F
F12	F12	—	TS1 sensor error	I/F

Check code			Check code name	Judging device
Wired remote controller display	Outdoor unit 7-segment display			
		Auxiliary code		
F13	F13	01:Comp. 1 side 02:Comp. 2 side 03:Comp. 3 side	TH sensor error	IPDU
F15	F15	—	Outdoor unit temp. sensor miscabling (TE, TL)	I/F
F16	F16	—	Outdoor unit pressure sensor miscabling (Pd, Ps)	I/F
F19	—	—	Hot water module TCJ2 (TF) sensor error	Hot water module
F22	F22	—	TD3 sensor error	I/F
F23	F23	—	Ps sensor error	I/F
F24	F24	—	Pd sensor error	I/F
F25	—	—	Hot water module TWI (TA) sensor error	Hot water module
F26	—	—	Hot water module TWO (TC2) sensor error	Hot water module
F29	—	—	Indoor unit other error	Indoor unit
F31	F31	—	Indoor unit EEPROM error	I/F
H01	H01	01:Comp. 1 side 02:Comp. 2 side 03:Comp. 3 side	Compressor break down	IPDU
H02	H02	01:Comp. 1 side 02:Comp. 2 side 03:Comp. 3 side	Compressor trouble (lock)	IPDU
H03	H03	01:Comp. 1 side 02:Comp. 2 side 03:Comp. 3 side	Current detect circuit system error	IPDU
H04	H04	—	Comp. 1 case thermo operation	I/F
H05	H05	—	TD1 sensor miswiring	I/F
H06	H06	—	Low pressure protective operation	I/F
H07	H07	—	Oil level down detective protection	I/F
H08	H08	01:TK1 sensor error 02:TK2 sensor error 03:TK3 sensor error 04:TK4 sensor error 05:TK5 sensor error	Oil level detective temp sensor error	I/F
H14	H14	—	Comp. 2 case thermo operation	I/F
H15	H15	—	TD2 sensor miswiring	I/F
H16	H16	01:TK1 oil circuit system error 02:TK2 oil circuit system error 03:TK3 oil circuit system error 04:TK4 oil circuit system error 05:TK5 oil circuit system error	Oil level detective circuit error	I/F
H25	H25	—	TD3 sensor miswiring	I/F
L02	—	—	Outdoor unit combination error	Hot water module
L03	—	—	Indoor unit centre unit duplicated	Indoor unit
L04	L04	—	Outdoor unit line address duplicated	I/F
L05	—	—	Duplicated indoor units with priority (Displayed in indoor unit with priority)	I/F
L06	L06	No. of indoor units with priority	Duplicated indoor units with priority (Displayed in unit other than indoor unit with priority)	I/F
L07	—	—	Group line in individual indoor unit	Indoor unit
L08	L08	—	Indoor unit group / Address unset	Indoor unit, I/F
L09	—	—	Indoor unit capacity unset	Indoor unit
L10	L10	—	Outdoor unit capacity unset	I/F
L17	—	—	Outdoor unit type mismatch error	I/F

Check code			Check code name	Judging device
Wired remote controller display	Outdoor unit 7-segment display			
		Auxiliary code		
L20	—	—	Duplicated central control addresses	AI-NET, Indoor unit
L26	L26	Number of heat storage units connected	Too many heat storage units connected	I/F
L27	L27	Number of heat storage units connected	Error in number of heat storage units connected	I/F
L28	L28	—	Too many outdoor units connected	I/F
L29	L29	Number of IPDU (*1)	No. of IPDU error	I/F
L30	L30	Detected indoor unit address	Indoor unit outside interlock	Indoor unit
—	L31	—	Extended I/C error	I/F
P01	—	—	Indoor fan motor error	Indoor unit
P03	P03	—	Discharge temp. TD1 error	I/F
P04	P04	01:Comp. 1 side 02:Comp. 2 side 03:Comp. 3 side	High-pressure SW system operation	IPDU
P05	P05	00: 01:Comp. 1 side 02:Comp. 2 side 03:Comp. 3 side	Phase missing detection / Power failure detection Inverter DC voltage error (comp.) Inverter DC voltage error (comp.) Inverter DC voltage error (comp.)	I/F
P07	P07	01:Comp. 1 side 02:Comp. 2 side 03:Comp. 3 side	Heat sink overheat error	IPDU, I/F
P13	P13	—	Outdoor liquid back detection error	I/F
P15	P15	01:TS condition 02:TD condition	Gas leak detection	I/F
P17	P17	—	Discharge temp. TD2 error	I/F
P18	P18	—	Discharge temp. TD3 error	I/F
P19	P19	Detected outdoor unit number	4-way valve inverse error	I/F
P20	P20	—	High-pressure protective operation	I/F
P22	P22	0*:IGBT circuit 1*:Position detective circuit error 3*:Motor lock error 4*:Motor current detection C*:TH sensor error D*:TH sensor error E*:Inverter DC voltage error (outdoor unit fan)	Outdoor unit fan IPDU error Note: Ignore 0 to F displayed in “*” position.	IPDU
P26	P26	01:Comp. 1 side 02:Comp. 2 side 03:Comp. 3 side	G-TR short protection error	IPDU
P29	P29	01:Comp. 1 side 02:Comp. 2 side 03:Comp. 3 side	Comp. position detective circuit system error	IPDU
P31	—	—	Other indoor unit error (Group follower indoor unit error)	Indoor unit
A01	A01	Detected hot water module address	Flow switch protective operation	Hot water module
A02	A02	Detected hot water module address	Low temperature water error	Hot water module
A04	A04	Detected hot water module address	Plate type heat exchanger freezing protective operation	Hot water module

*1 Number of IPDU

01: Comp. 1	05: Comp. 1 + Comp. 3	09: Comp. 1 + Fan	0D: Comp. 1 + Comp. 3 + Fan
02: Comp. 2	06: Comp. 2 + Comp. 3	0A: Comp. 2 + Fan	0E: Comp. 2 + Comp. 3 + Fan
03: Comp. 1 + Comp. 2	07: Comp. 1 + Comp. 2 + Comp. 3	0B: Comp. 1 + Comp. 2 + Fan	0F: Comp. 1 + Comp. 2 + Comp. 3 + Fan
04: Comp. 3	08: Fan	0C: Comp. 3 + Fan	

Error detected by TCC-LINK central control device

Check code			Check code name	Judging device
Central control device indication	Outdoor unit 7-segment display			
		Auxiliary code		
C05	—	—	Sending error in TCC-LINK central control device	TCC-LINK
C06	—	—	Receiving error in TCC-LINK central control device	TCC-LINK
C12	—	—	Batch alarm of general-purpose equipment control interface	General-purpose equipment, I/F
P30	Differs according to error contents of unit with occurrence of alarm		Group control follower unit error	TCC-LINK
	—	—	Decrease of No. of indoor units	

TCC-LINK: TOSHIBA Carrier Communication Link.

WARNINGS ON REFRIGERANT LEAKAGE

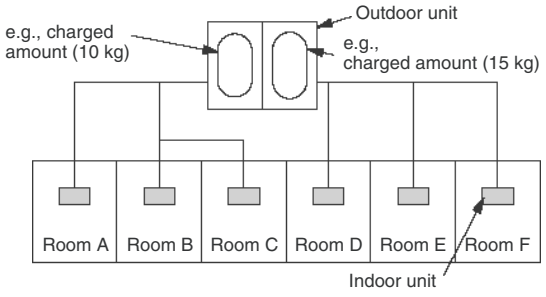
Check of Concentration Limit

The room in which the air conditioner is to be installed requires a design that in the event of refrigerant gas leaking out, its concentration will not exceed a set limit.
The refrigerant R410A which is used in the air conditioner is safe, without the toxicity or combustibility of ammonia, and is not restricted by laws to be imposed which protect the ozone layer. However, since it contains more than air, it poses the risk of suffocation if its concentration should rise excessively. Suffocation from leakage of R410A is almost non-existent. With the recent increase in the number of high concentration buildings, however, the installation of multi air conditioner systems is on the increase because of the need for effective use of floor space, individual control, energy conservation by curtailing heat and carrying power etc.
Most importantly, the multi air conditioner system is able to replenish a large amount of refrigerant compared with conventional individual air conditioners. If a single unit of the multi conditioner system is to be installed in a small room, select a suitable model and installation procedure so that if the refrigerant accidentally leaks out, its concentration does not reach the limit (and in the event of an emergency, measures can be made before injury can occur).
In a room where the concentration may exceed the limit, create an opening with adjacent rooms, or install mechanical ventilation combined with a gas leak detection device.
The concentration is as given below.

$$\frac{\text{Total amount of refrigerant (kg)}}{\text{Min. volume of the indoor unit installed room (m}^3\text{)}} \leq \text{Concentration limit (kg/m}^3\text{)}$$

The concentration limit of R410A which is used in multi air conditioners is 0.3 kg/m^3.

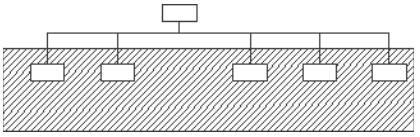
NOTE 1 :
If there are 2 or more refrigerating systems in a single refrigerating device, the amounts of refrigerant should be as charged in each independent device.



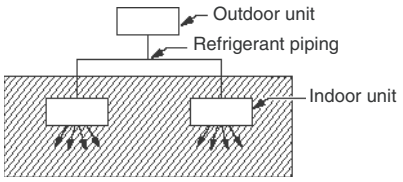
For the amount of charge in this example:
The possible amount of leaked refrigerant gas in rooms A, B and C is 10 kg.
The possible amount of leaked refrigerant gas in rooms D, E and F is 15 kg.

Important

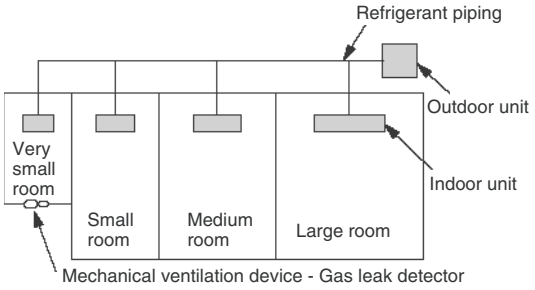
NOTE 2 :
The standards for minimum room volume are as follows.
(1) No partition (shaded portion)



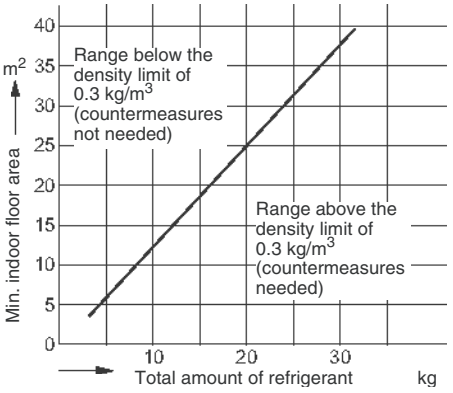
(2) When there is an effective opening with the adjacent room for ventilation of leaking refrigerant gas (opening without a door, or an opening 0.15 % or larger than the respective floor spaces at the top or bottom of the door).



(3) If an indoor unit is installed in each partitioned room and the refrigerant piping is interconnected, the smallest room of course becomes the object. But when a mechanical ventilation is installed interlocked with a gas leakage detector in the smallest room where the density limit is exceeded, the volume of the next smallest room becomes the object.



NOTE 3 :
The minimum indoor floor area compared with the amount of refrigerant is roughly as follows:
(When the ceiling is 2.7 m high)



TOSHIBA CARRIER CORPORATION
72-34 Horikawa-cho, Saiwai-ku, Kawasaki-shi, Kanagawa 212-8585, JAPAN
Copyright © 1999 to 2014 TOSHIBA CARRIER CORPORATION, ALL Rights Reserved.